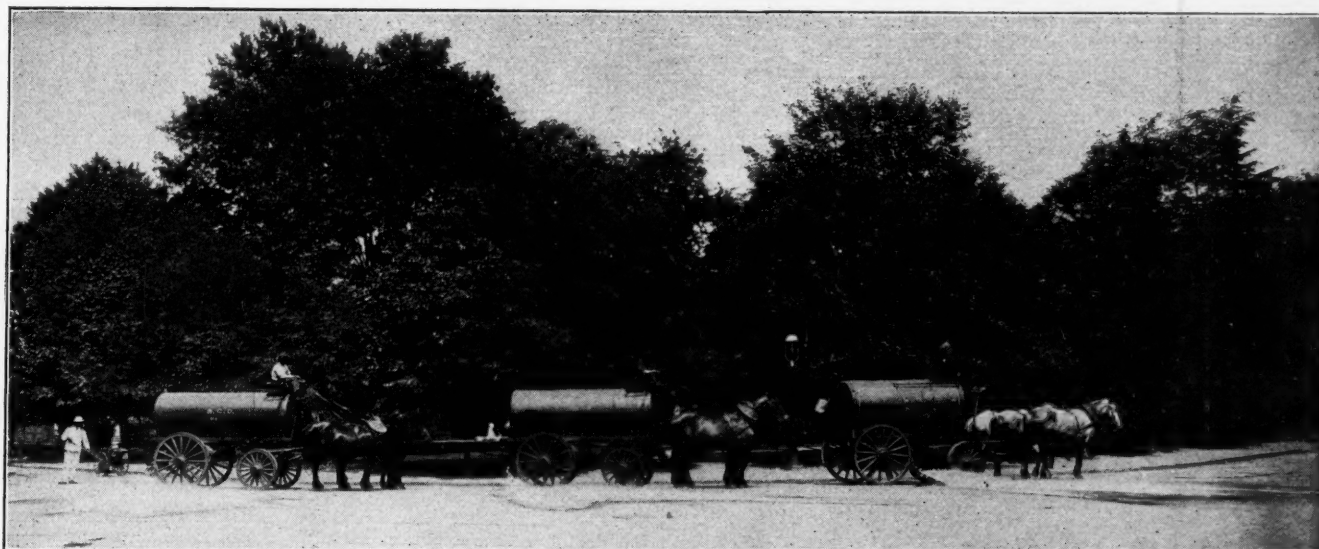


# Municipal Journal

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No. 19



STREET FLUSHING GANG IN WASHINGTON, D. C.

## RECORDS OF STREET CLEANING IN WASHINGTON

Recording Unit Quantities of Street Cleaning Work.—Subdivision of Areas.—Forms Used on the Street and in the Office.—Relative Cost of Machine Work and Hand Patrol.

By J. W. PAXTON, Superintendent of Street Cleaning, Washington, D. C.

Street cleaning in Washington, D. C., as a complete operation, with superintendence and labor employed directly by the municipality, dates from July 1, 1911. The cleaning of all alleys, suburban streets and that done by machine brooms was previously under contract, while the hand patrol work, sprinkling and street washing, was a direct municipal operation. The commissioners were led to believe that an entire elimination of the contract system would prove a success, and that the work not only could be done more cheaply but that better results could be obtained. The municipality was acquainted with the contractors' methods, and in many instances its inspectors practically acted as foremen to the contractors' gangs, payment being made to a large extent on the yardage basis, which required an inspector with each gang to certify to the area cleaned, as well as to see that it was properly done.

One of the first efforts after this change was made was to establish a cost keeping system so that the total expense could be distributed to the various classes of work, such as hand patrol, machine broom cleaning, squeegeeing, flushing, alley cleaning, suburban cleaning, oiling and snow and ice work. The total of each class of work was again divided so the cost of the work done by each gang could be obtained.

In order to obtain unit costs, it was necessary that a measure of the work should be established. It was

hoped that a unit could be found in which the elements of area swept, amount of dirt collected, length of haul, etc., would be combined in a proper proportion, but this still seems impracticable. Formerly contractors were paid by the thousand square yards, and, as this unit was generally used elsewhere, it was thought advisable to adopt it for purposes of comparison.

In making payment to the contractor it was necessary to have accurate and official information of the areas of streets and alleys cleaned, which was obtained from the Surface Division of the Engineering Department.

For purposes of computation, it was necessary to divide the area of each street into small sections, the most convenient divisions being the areas between cross streets and the intersections common to two or more streets. This information, together with the kind of pavement, is arranged on cards as in Figure 1, which are used exclusively in computing all areas mentioned hereafter.

For alley measurements an index card has been arranged, showing on the face the square number, area and kind of pavement, date measured, and the records of the schedules on which the alley in such square appears (Figure 2). On the reverse side is a plot of the alley measured as recorded (Figure 3). This plot is not strictly to scale but is valuable in showing exactly what is included in the measurement given. In many

cases a number of private alleys open on a general public alley but are not cleaned. From time to time these private alleys are condemned and then added to the schedule. In the illustration shown the area originally cleaned is solid. The cross-sectioned portion was later condemned and added to the schedule nearly four years later, the face of the card showing both the original and new areas.

G <sup>2</sup> NW			N. Cap. to 27 <sup>th</sup>								
Limits	Area	Per	Limits	Area	Per						
Tot. N. Cap.	99	Appl.	Tot. 7	278	Appl.	Tot. 17	209	Appl.	Tot. 25	972	Appl.
N. Cap. 1 <sup>st</sup>	3270	"	7-8	1320	"	17-18	2376	"	Tot. 25	128	"
Tot. 1 <sup>st</sup>	124	"	Tot. 8	158	"	Tot. 18	160	"	25-N.H.	664	"
1-N.H.	115	"	8-9	1320	"	18-19	1862	"	Tot. N.H.	244	"
Mch. N.H.	118	"	Tot. 9	225	"	Tot. 19	160	"	N.H.-26	616	"
Tot. N.H.	293	"	9-10	2967	"	19-20	1502	"	Tot. 26	128	"
N.H.-2	160	"	Tot. 10	178	"	Tot. 20	128	"	26-27	1336	"
Tot. 2	156	"	10-11	1427	"	20-21	1862	"			
2-3	1588	"	Tot. 11	365	"	Tot. 21	128	"			
Tot. 3	156	"	11-12	1420	"	21-22	2338	"			
3-4	944	"	Tot. 12	178	"	Tot. 22	128	"			
Tot. 4	124	"	12-13	2230	"	22-23	1352	"			
4-5	1518	"	Tot. 13	263	"	Tot. 23	210	"			
Tot. 5	250	"	13-14	3381	"	23-24	1349	"			
5-6	1311	"	Tot. 14	389	"	Tot. 24	128	"			
Tot. 6	178	"	14-15	2278	"	24-25	756	"			
6-7	2458	"	Tot. 15	311	"	Tot. 25	748	"			

FIGURE 1.

The Hand Patrol area consists at the present time, of approximately 2,856,000 square yards, or about 57 per cent of the total paved area of the city. It includes practically the entire business section and considerable residential territory adjacent thereto. At the present time this area is divided into five sections of from approximately 409,000 square yards to 810,000 square yards,

**SQUARE NO. 963 AREA 254 577**

PAVED WITH 1/4 BRICK				
MEASURED	5/21/19	4/4/13 HK		
ADDED TO SCHEDULE NUMBER	3, 5/27	1907		
CHANGED TO	DO	DO		191
" TO DO	DO	DO		191
" TO DO	DO	DO		191

FIGURE 2.

each section being under a foreman with a force ranging from 32 men and two wagons to 57 men and three wagons, the total force employed being 221 men and thirteen wagons, this giving an average area per man of about 13,000 square yards. This area per man seems to be somewhat larger than the average for other cities, and it is doubtless due, in part, to the frequent washing given the streets, to the fact that Washington has very

little commercial traffic, and that men are employed strictly on merit. Each gang may cover their territory several times during the day, but the area is only credited once. For one-half day's work but one-half the area is credited, etc. At the end of the month the total area is divided into the total cost charged to each gang, giving the unit cost.

Each foreman divides his large section into sub-sections to be worked by one, two or three men, and the limits of these sub-sections are reported to the office. Each foreman also reports the number of bags of street sweepings collected in each sub-section daily. The sub-sections are plotted in different colors on maps of the city, and the area cleaned and the quantity of dirt collected by each man indicated. To anyone familiar with the traffic of the city any errors in distribution of men are very apparent.

Experiments have been made as to the relative cost

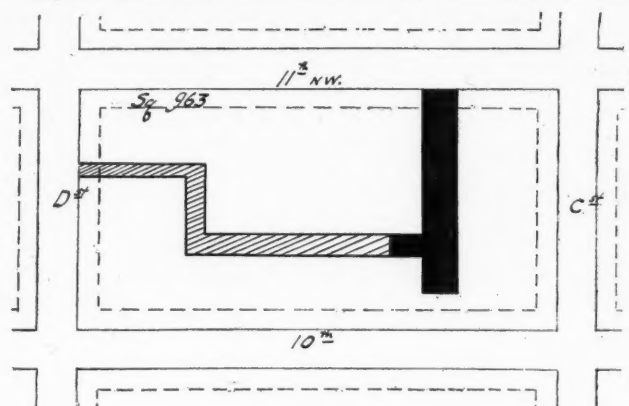
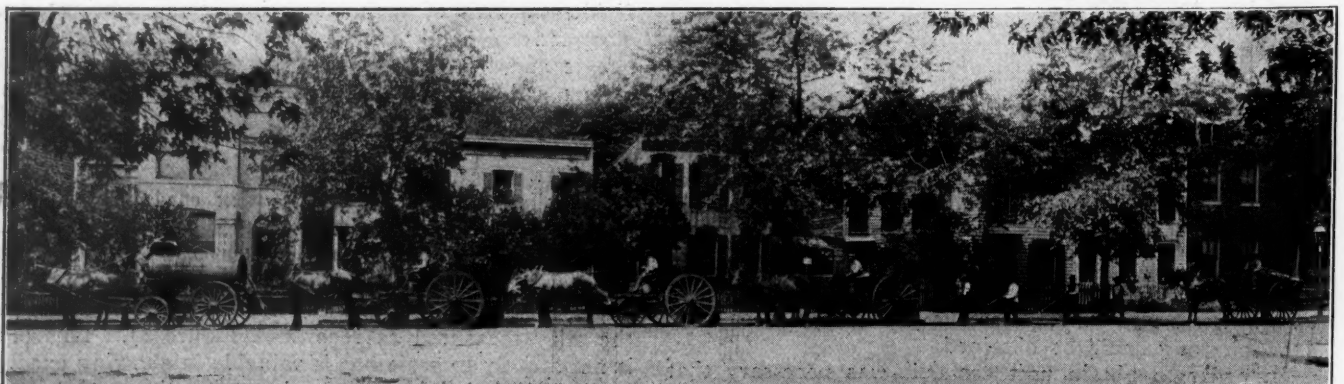


FIGURE 3.

of machine work and hand patrol. It was found that, when the same amount was expended on hand patrol as on cleaning by machine brooms every other day, in most cases the streets were kept in better condition. In hand patrol work, where the traffic conditions are variable, the distribution of the men can be increased or diminished accordingly, and the greatest attention given to the portions of the streets which need it the most. The attention is continuous, the streets being just as clean at one time as at another. With machine broom sweeping, however, the entire section and every portion of each street must receive the same amount of sweeping, the streets presenting a good appearance immediately after the passing of the brooms but no further attention being given until the street is swept again.

The Machine Broom area consists of approximately 2,000,000 square yards, or 43 per cent of the paved area of the city, this territory being almost entirely residential. Some of the streets with heavy traffic are cleaned daily, while others with very light traffic are cleaned



WASHINGTON MACHINE BROOM GANG.



three times in two weeks; but the majority are cleaned every other day.

The force employed in this work consists of two gangs of one sprinkler, three machines and four carts each, and one gang of two sprinklers, six machines and seven carts, sufficient broom men being provided to pile the dirt swept to the gutters by the machines, the number depending on the general conditions of the territory under attention.

Each foreman is furnished with a schedule (Figure 4), on which the areas of the streets are printed. He checks off the portions of the streets as he cleans them;

**MACHINE SWEEPING--Schedule NO. 2**

5 N.E.	C S.S.-E. CAP.	5,257	EYE S.E.	7-11	5,070
6	C S.S.-E. CAP.	4,602	K	7-11	4,313
7	Mass.-E. CAP.	3,135	M	S. CAP.-B	14,233
8	Mass.-E. CAP.	3,131	M	8-11	4,026
12	E. CAP.-G	4,269	B S.W.	1-3	3,460
13	N.C.-B	1,951	D	S. CAP.-3	6,835
14	N.C.-B	216	F	Del.-3	1,648
11 E.	Mass. NE.-PA. SE.	15,222	F	Del.-3	5,248
13 E.	N.C. NE.-Mass. SE.	2,900	G	S. CAP.-DEL.	3,791
1 S.E.	C-F	5,739	G	DEL.-3	3,107
2	PA.-VA.	8,663	H	1-DEL.	639
3	PA.-S.C.	5,821	H	DEL.-3	2,695
4	S.C.-N	5,037	EYE	1-DEL.	931
5	C-END(N)	9,580	EYE	DEL.-3	2,137
6	E. CAP.-PA.	4,584	K	S. CAP.-DEL.	4,692
7	PA.-VA.	7,670	K	DEL.-3	1,690
8	E. CAP.-PA.	5,774	M	S. CAP.-DEL.	5,196
9	PA.-E	3,145	MASS. N.E.	6-11	13,261
10	E S.S.-G	1,934	N.C.	E. CAP.-B	6,084
11	G-VA.	2,775	TENN.	E. CAP.-END	2,896
12	E. CAP.-D S.S.	9,155	E. CAP. N. SS.	11-13	6,787
13	D S.S.-K	6,948	E. CAP.	13-END(15)	7,693
14	E. CAP.-PA.	8,871	ANACOSTIA B.	O-G. HOPE RD.	9,238
1 S.W.	PA.-END(Va.)	6,990	CARROLL S.E.	1-2	1,709
2	PA.-VA.	5,819	C. HOPE RD.	B & O-MINN.	6,178
3	PA.-O	17,698	HECKMAN	1-2	1,792
4	E. CAP.-B	2,645	IVY	CANAL-N. J.	1,500
5	PA.-EYE	3,560	KV	S. CAP.-B	2,860
6	G.H. RD.-END(V)	3,365	N. J.	C-E	5,902
7	B-G	8,371	N. J.	E-EYE	6,533
8	G-M	7,074	N. J.	EYE-M	4,544
9	MO-K	14,039	NICHOLS	G.H. RD.-END(FRANK)	10,546

REMARKS	STREETS	FROM	TO	AREA
Swept	1 <sup>st</sup> S.E.	C	E	1,924
Repairing	1 <sup>st</sup> S.W.	D	F	3,438

SPRINKLERS	1	MACHINES	3	CARTS	4	NO. LOADS	12	BBL. WATER	2
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STREET CLEANING DEPARTMENT, WASHINGTON, D. C. Sept. 5<sup>th</sup> 1913 *John Ladd* FOREMAN

Total checked 289,176  
 Added 27,123  
 Cut 2,658  
 Total cleaned 289,176

FIGURE 4.

fills in the spaces for information in regard to equipment, quantities of dirt removed and water used, and returns the schedule to the office, where the total area is figured and credited to his gang. It is not practicable to print the schedules in the order in which the streets are to be cleaned. It requires about two full working days for each gang to sweep their section; but if they are delayed for any reason, such as bad weather, it would disarrange any regular route. They are required, however, to sweep continuously from the time they leave the stable until they return, and in order to do this they sweep one side of a running street going out, leaving the other side to be swept on their return. After reaching their territory, the order of sweeping is arranged as seems best in the judgment of the foreman at the

time, but regular intervals must exist, as far as possible, between the cleanings of each street.

The area covered by the Squeegee Sections comprises about 1,766,000 square yards of the smoothly-paved streets in the White Wing section, this being about 64 per cent of the total White Wing area. The force employed on this work consists, at the present time, of three gangs, each composed of one sprinkler and three machines, the territory being covered about twice per week.

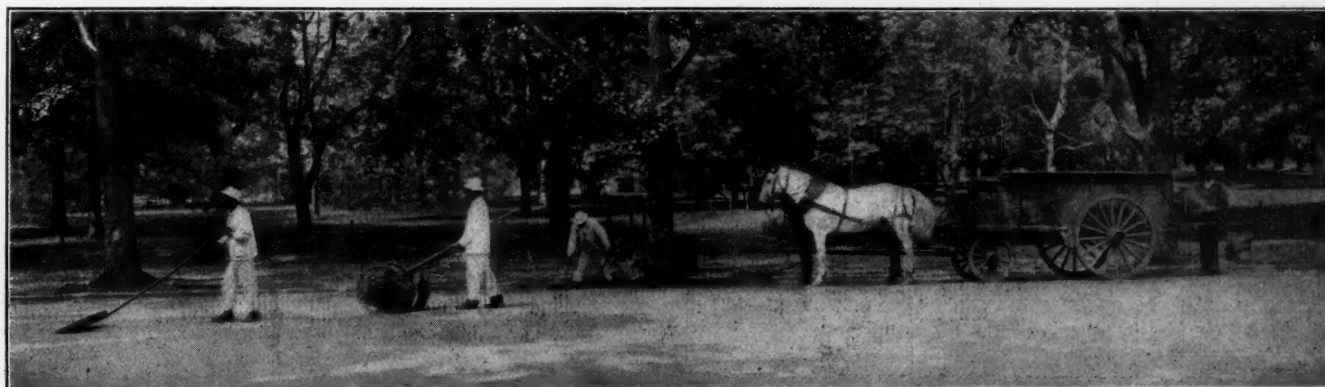
The Flushing Area comprises all worn and block pavements in the White Wing area, the entire territory totaling approximately 300,000 square yards, or 11 per cent of the total White Wing area, each street being flushed about twice weekly by a gang of three machines.

The Suburban territory consists of approximately 1,500,000 square yards of water-bound macadam, or unpaved streets. The work done in this territory is to keep the gutters clean, remove all trash, ravelings and weeds; two gangs of ten men and four carts each being employed. This territory is treated with emulsified oil about once every fifteen days during the spring, summer and fall, three supply and two spreader wagons being regularly employed.

The schedules for street washing, suburban cleaning and oiling are similar to the machine schedules previously described.

The alley system of Washington totals approximately 1,000 alleys, the area amounting to about 1,000,000 square yards. The majority of these alleys are wide and well paved. Three alley gangs are at work at the present time, two consisting of a sprinkler, one-horse sweeping machine broom, three carts and six laborers each; the other being a small hand gang of one sprinkler, three carts and four laborers, which mostly cleans narrow and very dirty alleys.

The alley schedules are similar to those for machines, except that the alleys must be cleaned in the order given and the areas computed from the alley area cards (Figure 2). After the contract system was abolished when all alleys were cleaned by hand, it was found by experiment that many alleys could be more economically cleaned by one-horse machine brooms. Squares containing alleys were classified into those which could be swept (1) entirely by machines; (2) by machines with one hand shaft; (3) by machines with two or more hand shafts; (4) by hand; (5) partly paved, and (6) unpaved. On a map of the city all squares corresponding to the first classification were colored in red, the second green, and so on, using a different color for each classification. Two alley schedules were then traced out, containing, as far as possible, all the squares in the first three classifications, to be cleaned by machines; the balance making up a schedule containing the squares in the last three



WASHINGTON HAND PATROL

classifications, to be cleaned by hand. An attempt was made, in each case, to arrange the squares in such order as to minimize the distance from the outlet of the alley in one square to the entrance to the alley in the next.

500-9-18-13

ENGINEER DEPARTMENT D.C.

STREET CLEANING DIVISION

OFFICIAL ORDER

DATE Nov 27<sup>th</sup> 1912.

MR. Weir

FOREMAN Flushing SECTION NO. 1

YOU ARE HEREBY AUTHORIZED TO (Add) THE FOLLOWING (to) YOUR REGULAR SCHEDULE.

1<sup>st</sup> St from Penn Mt. to  
Garfield Circle.

ABOVE CHANGES TO BE effective at once

James A. Carter  
SUPERINTENDENT.

FIGURE 5.

Of course, where hand alleys were isolated and surrounded by machine alleys, they were absorbed in the machine schedule and machine alleys were, in many cases, included in the hand schedule. The lines on the map representing the movements of the alley gangs have the appearance of a maze, but it is believed that the schedules are as nearly perfect as they can be made.

All schedules are considered as orders to the foreman. If temporary or permanent changes are to be made, a blank form (Figure 5) describing these changes is filled out, signed by the superintendent or one of his assistants, and issued to the foreman, who uses this form as his authority until its expiration or new schedules are issued on which the correction has been made.

Information is often desirable as to the dates on which certain streets or alleys have been cleaned, or streets washed or oiled. This previously necessitated a long search of old schedules. A simple graphical method

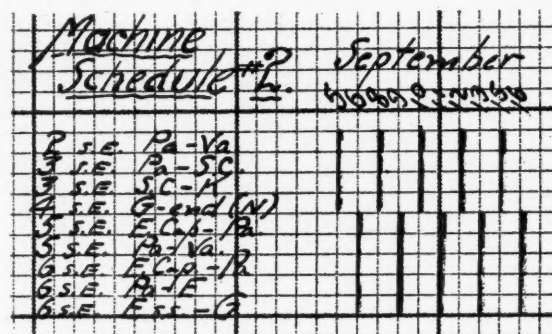


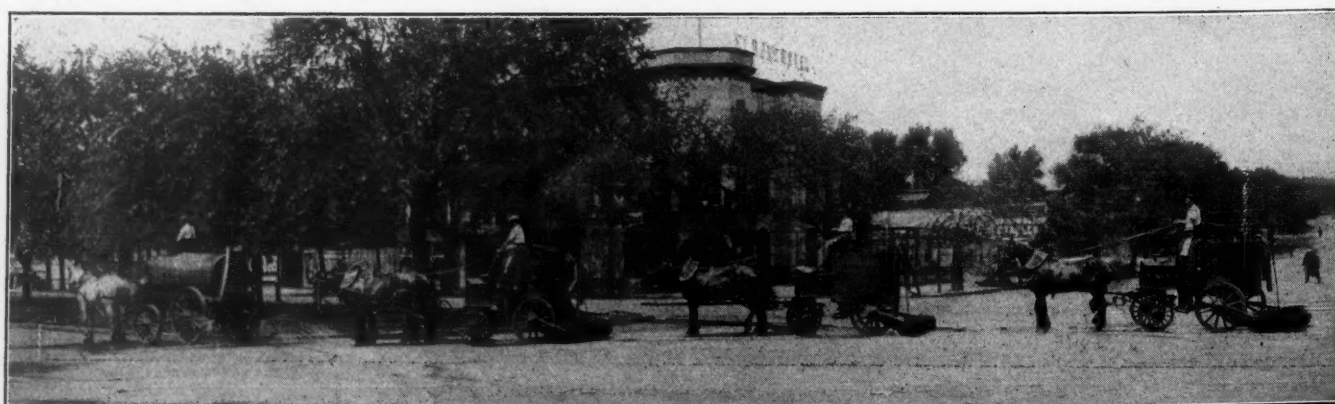
FIGURE 6.

of keeping this record has been devised which is also useful in showing at a glance whether streets have received regular attention for extended periods. The illustration (Figure 6) shows a portion of the machine schedule shown in Figure 4. Second street, S. E., from Pennsylvania avenue to Virginia avenue, is checked on Figure 4, indicating that it was cleaned on September 5th. This is shown on Figure 6 by a vertical line opposite the street and under that date. From machine schedules of other dates, similar information is plotted, Figure 6 showing this street was also cleaned September 8, 10, 12 and 15. One such plot is kept for each street cleaning gang, whether machine, alley, suburban, or washing; each plot usually running for three months.

All of the information obtained, described above, is used primarily for the purpose of figuring unit costs, which are essential in comparing costs of different classes of work, one gang's work with another in the same class, previous contract work with the present method, and the cost of street cleaning work in other cities with our own. A work summary for the year is compiled as a matter of record and is given for the fiscal year ending June 30, 1913, as follows:

Class of work	Material Removed					Average force per working day of 8 hours						Days Worked			1,000 sq. yds. cleaned
	Wagon-loads	Cart-loads	Cubic yards	Tons	Carts	Wag-ons	Sprink-lers	Ma-chin's Sq'gees	Flush-ers	Hired teams	Men	Calen-dar	Actual		
Machines ...	...	14,632	29,264	14,632	16.9	...	4.0	12.4	...	0.1	53.5	270	261.3		286,067
Alleys .....	...	5,199	7,799	5,199	9.5	...	3.0	1.9	...	...	33.1	267	251.5		61,354
Suburban ...	...	11,313	11,313	11,313	8.2	...	0.2	0.2	...	0.7	34.4	247	237.6		43,595
Hand Patrol. 9,231	...	...	36,924	18,462	...	14.4	...	...	...	...	249.1	290	275.4		766,918
Flushing ....	...	...	*	...	...	...	...	...	3.1	...	3.1	262	243.3		20,703
Squeegeeing. ....	...	...	*	...	...	...	2.4	...	7.4	0.7	9.8	267	250		144,629
Sprinkling... ..	...	...	...	...	...	...	1.3	...	...	...	1.3	83	66		...
Oiling .....	...	...	...	...	...	...	5.1	...	...	...	5.5	100	90.6		8,240
Snow and Ice ....	...	...	...	...	...	...	...	...	...	...	331.8	2	1.7		...

\*Sweepings piled in the gutter and removed by the patrolmen, and included in total given for that class of work.



WASHINGTON SQUEEGEE GANG.



## CATCH BASIN CLEANING

### Motor Truck With Pump for Removing Water and Boom and Fall for Raising Bucket.—Increased Capacity and Speed.

By GEORGE A. CARPENTER, City Eng. of Pawtucket, R. I.

The City of Pawtucket, R. I., has recently built and put into service a motor truck for the cleaning of catch-basins. With several increases in the wages of the men that have been made during the past few years, and with the constantly increasing length of haul as available dumping places near the central portion of the city become filled or occupied, the cost of catch-basin cleaning has annually advanced. Where it was possible to remove this material for about seventy-five cents per cubic yard in 1901, it was costing more than double this amount in 1909 and, allowing for the increase in wages made in 1912, the figures of 1909 become \$1.80 per cu. yd. It should also be noted that the above figures do not include interest upon the cost of the carts nor depreciation or repairs upon the same.

The old way of doing this work is illustrated in Figure 1 and much of the cost of this method of cleaning is due to the time taken to raise the bucket by hand and to that required to make the long hauls to the dumping ground. A further loss is seen in the cart and man in the background waiting for an opportunity to load.

By the new method, illustrated in Figure 2, a larger bucket is used and it is raised and dumped more quickly. The number of trips to the dump is reduced, as the capacity of the truck is three and one-quarter times that of the carts and its speed is much greater than that of the horse. A recent timing of this truck under the conditions of ordinary service gave an average speed of six miles per hour, including dumping but excluding loading.

The truck itself is a "Standard" chassis with 32 h. p. engine and this portion was made in Detroit, Mich. The

remainder of the equipment was developed at the shops connected with the Highway Department of the city and from ideas suggested by the assistant commissioner of public works, Joseph Wood. A body was constructed of steel plates and mounted on the chassis in such a manner as to be readily dumped by means of an hydraulic lift operated by the engine. The method of dumping is clearly illustrated in Figure 3.

To operate the fall used to raise and lower the bucket, a 2 h. p. Fairbanks-Morse gasoline engine was mounted on one side of chassis upon a pair of 6 inch I beams



FIG. 1. OLD METHOD OF CLEANING BASINS.

extending over the frame and carrying on their opposite ends the necessary gearing and clutches. The top of this engine is seen in Figure 2 over the driver's seat and its mounting is more clearly shown in Figure 3.

Figure 2 also shows the gears and clutches by which the fall is operated. The clutch lever controlling the bucket is operated by the man standing on the running-board, but its location is concealed in the photograph by the position in which this man is standing.

Since this machine was put into service it has been found necessary to turn the boom carrying the bucket by

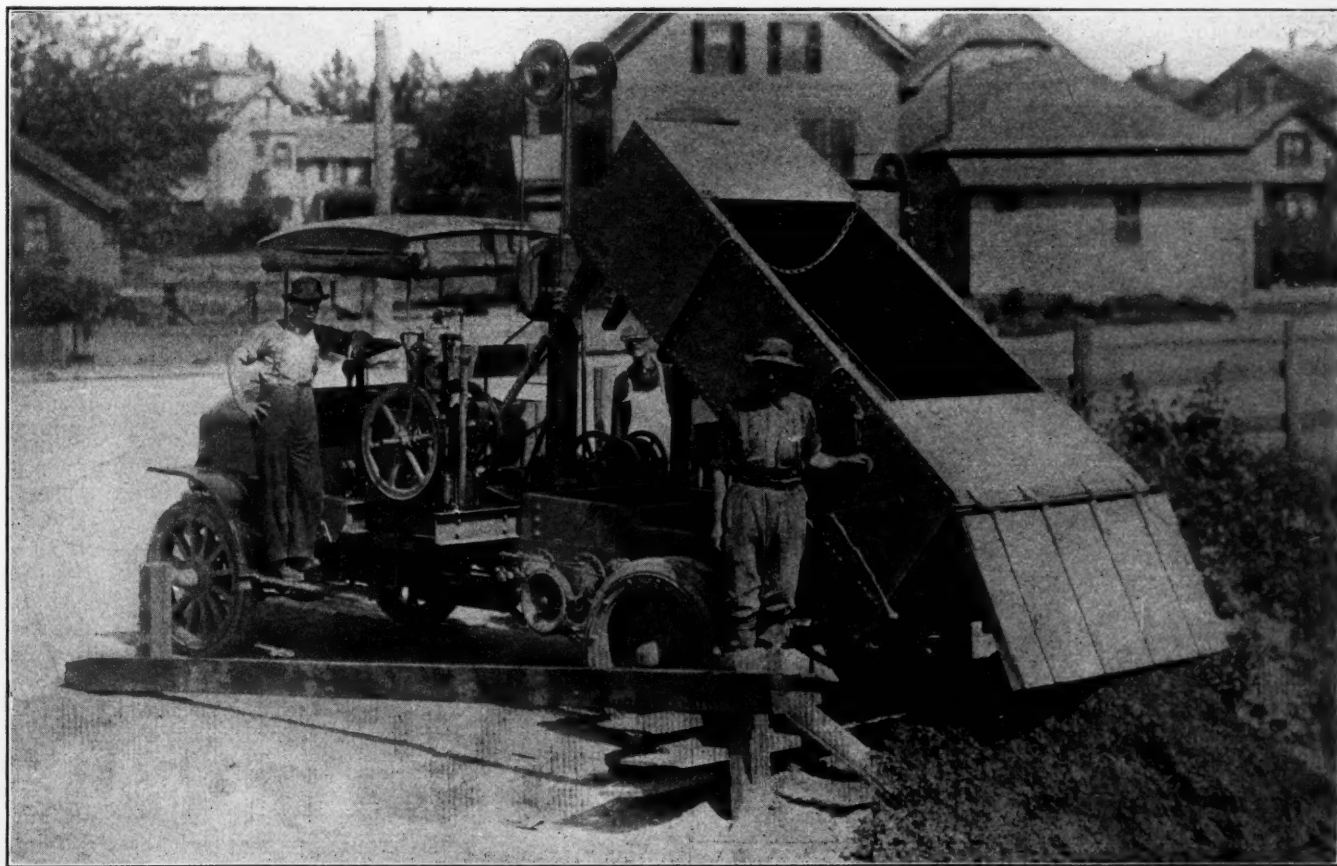


FIGURE 3. DUMPING CATCH BASIN CONTENTS FROM TRUCK.

a lever worked by the man standing upon the ground. The tilting of the truck when located near a basin, with the wheels of one side in the gutter and the opposite wheels on higher ground, made it difficult for the man

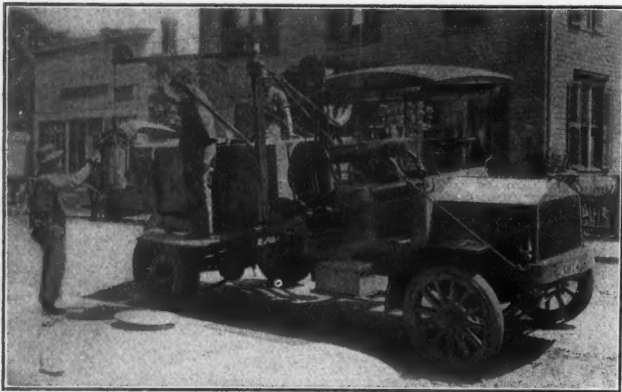


FIG. 2. RAISING BUCKET INTO TANK.

on the running-board to swing the bucket as shown in Figure 2.

The wheel-base of the truck is 144 inches and it weighs 10,600 lbs. when empty. It carries an average load of about 7,000 lbs. but has carried a load of over four tons. The inside measurements of the body are 4 ft. wide at the front, 4 ft. 9½ ins. wide at the rear, 9 ft. long and 28 inches deep. The top is covered at the front and rear by plates 2 ft. wide to prevent the slopping of a load consisting of wet material. These plates are clearly shown in Figure 3.

The truck complete has cost approximately \$4,200 and the cost of operation, figured from two months' service, August and September, is as follows:—

Interest for two months, at the rate of 5% upon the cost .....	\$35.00
Depreciation and repairs at 10% per year .....	70.00
Approximate cost of tires .....	52.50
Gasoline and oil .....	40.85
<b>Total .....</b>	<b>\$198.35</b>
<b>Wages .....</b>	<b>334.00</b>

Total cost of two months' operation.....\$532.35

The total number of basins cleaned was 227 and the total number of cubic yards of material removed from these basins was 408. This gives an average cost of \$2.345 per basin or \$1.305 per cubic yard.

The truck is now operated by three men, a driver who also guides the bucket and controls the swing of the boom from the ground, a man on the running-board who



FIG. 4. REAR VIEW OF TRUCK.

dumps the bucket and trims the load and a man in the catch-basin to load the bucket.

Experiments are now being made with a self-loading bucket, which gives promise of a still further reduction of costs.

Since this truck was put into operation, a 1½-inch centrifugal pump has been added by means of which the water in the basin above the sand is pumped out more quickly than it was formerly bailed out by hand. The location of this pump and its priming apparatus is shown in Figure 4 at the end of the tool box and just below the frame supporting the gears. This photograph also shows the method of holding and releasing the rubber gasketed tail-board.

## WRAPPING GARBAGE IN TRENTON

### Insures Drainage, Keeps Pails Cleaner and Reduces Cost of Incineration.—Citizens Generally in Favor of This Method

By JOHN T. McCLAIN, Superintendent Department of Garbage and Ashes, Trenton, N. J.

Trenton, N. J., collects and disposes of its garbage through the Department of Garbage and Ashes, of which the writer is superintendent. We use eight garbage wagons of three yards capacity for our collections. We also have an incinerating plant whose capacity is fifty tons of garbage a day.

Ever since this department was established it had been the custom to mix the garbage and the rubbish, or as I might call it mixed garbage. For the last six years this department was compelled to work seven days a week, day and night, in order to incinerate the city's garbage during the summer months. The last two years we were unable to care for all the garbage and had to haul some of it to farms and destroy it there.

In January, 1913, the director of public safety, George B. LaBarre, health officer Dr. A. S. Fell and myself held a conference on the disposal of garbage and the sanitary conditions of the city; also as to increasing the capacity of the present crematory. At that conference it was shown that some citizens were in the habit of placing a great amount of liquid matter in their garbage for collection and we came to the conclusion that if we had the citizens drain off the liquid it would relieve the present condition of the crematory and Mr. LaBarre felt that if the citizens were required to wrap up their garbage they would have to drain it of its moisture. As Mr. LaBarre is also director of the police department we could count on some assistance from that department also in enforcing any such regulations.

In March of the same year, Mr. LaBarre had an ordinance passed requiring the wrapping of all the garbage, and it was well advertised in all the local newspapers, that unless the garbage was placed for collection as provided by the ordinance the collectors would refuse to collect the same. The police of the city were also requested to call this ordinance to the attention of any citizen that did not wrap the garbage according to the new rules.

I may say that during the first two days under this new rule we had many protests concerning it, but when they found their garbage was not collected unless it was wrapped, the citizens soon lived up to the new rules requiring the wrapping. Moreover they soon found the advantage that it was to them. They found that it was much more sanitary than the old way as it meant their garbage cans were much cleaner and they were no longer troubled with flies around their cans. They also found it much better to have their garbage wrapped than to



have it in front of their homes lying loose as heretofore. Many citizens now never use their cans, but carry out the bundles and place them for collection on the curb line, and when the collector has passed they have no cans to remove.

I may say that the few protests that we received at the beginning of the enforcement of the rules have entirely ceased. The citizens now feel that it has been one of the greatest benefits they have received. They recognize that it is much more sanitary and that it has practically eliminated the house-fly nuisance. In place of receiving protests, we are receiving congratulations and they are asking who brought the change about.

At the present time, instead of having to work seven days a week, night and day, to incinerate the garbage we collected, we now have been able to incinerate all the garbage in twelve hours' time, therefore bringing the relief desired at the present crematory, in addition to making our city much more sanitary.

In concluding, I wish to say that our citizens are to be congratulated for having lived up to this new rule, as they are the ones that helped to make it the success that it is.

#### DISPOSAL OF REFUSE.

All material that will burn is placed with the garbage and all other material with the ashes. The city is divided into two parts and collections of both garbage and ashes are made from each three times a week. The garbage is hauled an average of  $1\frac{3}{4}$  miles over streets which are in general practically level; the ashes an average of  $\frac{3}{4}$  of a mile. For the garbage we use a 3-ton Haywood wagon, two  $2\frac{1}{2}$ -ton Columbia wagons, two  $2\frac{1}{2}$ -ton covered wagons of special make and other  $2\frac{1}{2}$ -ton wagons, some of which are used for garbage in summer and for ashes in winter. There is one man to each wagon. Burlap covers are used. For garbage, 9 wagons are used in summer, 6 in winter. For ashes 4 are used in summer and 9 in winter.

The garbage is burned in a Davis incinerator. The ashes are placed on dumps. The cost of collecting garbage last year (the fiscal year ending March 1) was \$1.09 5-6 per ton; that of ashes  $34\frac{1}{4}$  cents per ton. This includes all expenses, including the superintendent's salary. The average daily collection of garbage was 50 tons in summer and  $32\frac{1}{2}$  tons in winter. The ashes averaged 83 tons in summer and 163.8 tons in winter. About 12-

930 tons of garbage and 38,470 tons of ashes were collected during the year. The cost of the service was as follows:

#### EXPENDITURES OF THE DEPARTMENT FOR THE FISCAL YEAR MARCH 1, 1912, TO MARCH 1, 1913.

##### Cost of Garbage Collections.

Labor .....	\$6,819.83
Feed .....	4,129.61
Horses .....	290.00
Harness and Repairs.....	288.99
Wagons and Repairs.....	1,328.15
Veterinary and Drugs.....	32.75
Horseshoeing .....	515.00
Light .....	30.27
Repairs to Plant and Buildings.....	179.07
Miscellaneous .....	578.48
Supplies .....	12.13
Total.....	\$14,204.28

##### Cost of Ash Collections.

Labor .....	\$6,372.01
Feed .....	3,493.93
Horses .....	290.00
Harness and Repairs.....	270.66
Wagons and Repairs.....	1,250.35
Veterinary and Drugs.....	34.40
Horseshoeing .....	543.02
Light .....	24.63
Repairs to Plant and Building.....	179.07
Miscellaneous .....	574.63
Supplies .....	5.27
Team Hire .....	138.00
Total.....	\$13,175.97

##### Cost of Incineration.

Fuel .....	\$940.44
Light .....	63.30
Tools and Repairs.....	101.20
Miscellaneous .....	500.17
Furnace Repairs .....	569.46
Disinfectants .....	46.97
Labor .....	4,412.94
Total.....	\$6,634.48

Loss caused by fire that was not covered by Insurance .....	\$184.74
Loss caused by fire that was covered by Insurance .....	289.15
Cost of Ash Collections.....	13,175.97
Cost of Garbage Collections.....	14,204.28

Grand Total .....\$34,488.62

This gives the cost of incineration as 51  $\frac{1}{3}$  cts. per ton, of which about  $7\frac{1}{4}$  cts. was for fuel.

## STREET CLEANING IN SEVERAL CITIES

### Keeping Records of Contract Cleaning in Wilkes-Barre.—Methods of Cleaning in Omaha, Columbus and Schenectady.—Frequency of Cleaning by Each Method in All the Larger Cities.

#### IN WILKES-BARRE.

Cleaning the streets of Wilkes-Barre, Pa., is done by contract, and is paid for not by the lump sum, but by the areas cleaned. It is therefore necessary that the city keep accurate track of the amount of cleaning done by the contractor, and this work is in the hands of an inspector who reports to the City Engineer. The reports are made out by the inspector on printed blanks, each blank designed to receive the report of one-half month.

The streets to be cleaned are divided into six groups, and a separate price is paid for each group. Group No. 1 is sub-divided into two sets of streets, one of which is hand cleaned six times and flushed three times each week; the other being hand cleaned three times and hose flushed once each week. In this group the flushing is not counted in estimating the amount of payment, but payment was based upon six cleanings per week and three cleanings per week, respectively. Group

2 consists of those streets which are cleaned by machine broom five times and flushed once each week, payment being based on six cleanings per week. Group 3 comprises those streets which are cleaned by machine broom three times and flushed once each week, the payment being based on four cleanings per week. The streets in group 4 are cleaned by machine broom five times in two weeks and flushed once in two weeks, payment being based on three cleanings per week. Group 5, which is larger than any of the others, consists of those streets which are cleaned by machine broom three times every two weeks and flushed once every two weeks, payment being based on two cleanings per week. The sixth group consists of a few parts of streets which are included in the other groups, but which have an additional cleaning by hand every Sunday. The prices received for each thousand square yards of cleaning done are as follows: First group, 45 cents; second group, 22

cents; third group, 24 cents; fourth group, 26 cents; fifth group, 30 cents; sixth group, 39 cents. Hand cleaning is carried on for fifty-two weeks in the year, while machine broom cleaning and flushing are not employed between December 1st and April 1st.

In the blank form which is filled out by the inspector there are ten pages, one or more pages being devoted to each group, and the schedule of cleanings for that group printed at the top of the page. The balance of the page is ruled in vertical columns, the left hand one containing the names of the streets or sections of streets included in the group, followed by columns headed "Monday, Tuesday, Wednesday," etc., for three full weeks (so as to permit of entering a half month, which would ordinarily begin and end in the middle of a week); then a column headed "Total number of cleanings"; one giving the number of square yards in each street or section of street appearing in the first column (these areas being constant, and printed in the column); and finally the column for the total number of square yards cleaned, which is the product of the numbers in the two previous columns. The inspector each day checks off in the appropriate column the streets or sections of streets which were cleaned that day, and at the end of the half month adds these check marks horizontally and places the sum in the column headed "Total number of cleanings."

The last page is headed "Equipment," and on this are entered the numbers of foremen, men in the hand district, men outside of hand district, hand carts, flushers, sprinklers, sweepers, two-horse wagons, one-horse wagons, carts, refuse cans. A column is also provided for entering the wages per day of each of these.

There are about 38 miles of paved streets in the city. The area subject to hand sweeping is 221,500 square yards, that subject to machine sweeping is 441,200 square yards. All of this is flushed more or less frequently with either machine or hand flushing. The average amount of cleaning done per week by hand is 1,071,400 square yards, and that by machine sweeping, 1,092,700. For this information we are indebted to the City Engineer, B. K. Finch.

#### STREET CLEANING IN OMAHA. BY A. C. KUGEL, Street Commissioner.

Omaha, Neb., has 3,044,870 square yards, or 160 miles of pavements. The Street Cleaning Department receives annually \$60,000 to expend on the streets for cleaning, including also office force and equipments. There are 10 miles of pavements in the retail district, which are covered daily by the "White Wings," one man covering four blocks. The remaining 150 miles of pavements in the city are cleaned by four flushing wagons working a double shift of eight hours each, with one broom man working the gutters; and two dry cleaning gangs, consisting of one foreman, one team, and six laborers. These 150 miles are cleaned every eight or ten days. A dry cleaning gang covers from 50 to 80 blocks per day, while the four flushing teams clean an average of 75 blocks per shift.

The wages of the foremen are \$80 per month; the flushing teams, \$5; the dry cleaning teams, \$4, and the laborers, \$2 per day; eight hours constitute a day's work. One general foreman receives \$125 per month.

One team and three men are constantly cleaning the paved alleys, and occasionally the unpaved streets and alleys are gone over by one of the gangs to gather what refuse might be found. The dry cleaning is done between the hours of 8.00 A. M. and 5.00 P. M.; the flushing, worked in a double shift, between the hours of 3.00 A. M. and 8.30 P. M. During the interval between 8.30 P. M. and 3.00 A. M., the flushing wagons are left

on the street, in suitable locations, where the teams unhitch. They are in charge of a watchman, who takes care of them, greasing the wheels, etc., so as to have them in proper shape for the early morning shift.

Paper is a constant source of annoyance, and one man is kept traveling the downtown streets picking up the loose papers. This is done from 8.00 A. M. to 10.00 P. M. After 5.00 P. M., the quitting time for "White Wings," one man is kept traveling the downtown streets until 10.00 P. M. picking up horse litter. The waste-paper boxes on the street corners are emptied by one man with a horse and wagon, for which he receives \$60 per month.

The above refers to street cleaning in the summer time only, as in the fall, when the leaves are heavy, and for removing snow in the winter, different methods are used.

Some "White Wings" dump the cleanings direct into the sewers; others deposit them in receptacles placed in the alleys, and a pick-up team hauls them off. The records show that from January 1, 1913, to September 1, 1913, there were 49,577 city blocks cleaned, making 10,057 wagon-loads of refuse hauled away. During the same period, there were 10,897 city blocks flushed by the Street Cleaning Department.

The soil and elements of a city enter largely into the cost of street cleaning. For instance, in a city with all streets paved, a heavy rain cleans the pavements better and much more quickly than the entire cleaning department of that city could do it. But where the paved streets are scattered this same heavy rain adds cost to the street cleaning department, as the dirt from the unpaved streets (especially in a city like Omaha, where there is much clay) is carried from the unpaved streets onto the pavements and will be tracked for several blocks by wagons passing. To remove this dirt requires considerable labor that would have been avoided if all the streets had been paved. Again, the wind must be taken into consideration. In a city with but little wind, refuse from passing teams is scattered all over the streets, necessitating the sweeping of the entire street surface. But if the wind is a high one, the refuse will be blown into the gutters and can be more quickly removed.

#### STREET CLEANING IN COLUMBUS, OHIO.

In his report for the year ending December 31, 1912, Nathan A. McCoy, superintendent of the Street Cleaning Department of Columbus, Ohio, describes the methods and amount of work done by that department during that year, which we condense in the following:

The department employed machine cleaning, hand cleaning, hand patrol and flushing. It also cleaned catch basins and sprinkled dirt and macadam roadways. Streets which were cleaned by machine brooms were covered from two to twelve times per month, the number of cleanings as well as the method to be employed being determined by the majority of the abutting property holders on each street. During the year, 95,884 great squares (10,000 square feet equals a great square) was swept by machine, a daily average of 120 great squares for each of five crews. It was found, however, that with such a large area to cover it was almost impossible to render satisfactory service, since it required overtaxing the men and teams by doing ten hours' labor in eight hours. Five sweeping crews were employed, and Mr. McCoy recommended the addition of another crew for this year, which would reduce the requirement to only 103 to 105 great squares a day. The five machine sweeping crews removed 10,067 loads during the year, each load estimated to contain 4 cubic



yards. The cost of this cleaning was 28.56 cents per great square.

Hand sweeping was employed in cleaning the central alleys of the business districts, where it is found to be far more practical than machine cleaning because of the congestion of traffic therein. One crew of six laborers and a foreman was employed in this work. This crew covered 5,012.44 great squares during the year, a daily average of 31.32 great squares, and removed 614 loads, estimated to contain 2,456 cubic yards. This crew also attended to cutting weeds during the latter part of August, and to all the gutter cleaning. During the weeks of August 19 to 26, eight gangs of laborers were employed at 25 cents per hour to clean weeds from the dirt and macadam gutters and from lot line to curb on each side of the street, at a total cost of \$5,515. This gang removed 2,622 loads of dirt and weeds.

The hand patrol system cleaned 59,850 great squares during the season, from which were removed 10,960 cubic yards of dirt. The hand patrol force averaged 37 laborers and four teams, and was employed mostly in the business and residence sections. The hand patrol is considered by the superintendent to be much more serviceable than any other method, especially where the streets are worn and the surface uneven. The average cost by this method was 32.95 cents per great square.

Flushing was used over a total area of 18,550.73 great squares during the season, and 12,236 cubic yards of dirt and mud were removed. Two flushing crews operated, one as a day and the other as a night shift. The average daily area covered was 109.12 great squares. The average cost was 0.624 cents per great square.

The use of flushing has been found to greatly increase the amount of deposits collecting in the catch-basins, so that in 1912 it was found necessary to add an extra catch-basin cleaning crew in the flushing districts. During the year, 14,291 catch-basins were cleaned, and 1,467 loads of mud were removed from them, at a total cost of \$3,836.70, an average cost per basin of 26.84 cents. The catch-basin crew devoted one day in each week to removing the paper from the 90 rubbish cans which are placed at various locations throughout the city. These cans are 30x20x36 inches. The cost of emptying these was \$312.

The general expenses of the department are divided into City Hall expenses, yards and shops, and stable maintenance. The City Hall force includes two street cleaning assessment clerks; and during about three months of each year two emergency clerks in the City Auditor's and Treasurer's departments, respectively. This service cost \$3,111.67 in 1912.

The maintenance of the yards and shops during the same year cost \$7,292. Until April 1st, these were under the supervision of the Street Cleaning Department, on which date they were transferred to the Garbage Department, but were retransferred to the Street Cleaning Department later in the year. All machine brooms are manufactured at the broom shop, 109 having been made there in 1912 to supply the ten sweepers. The blacksmith and repair shops make all wagon repairs, machinery repairs and, in fact, the general repairs on all equipment.

The stable is operated by three shifts: a day shift of three men, an evening shift of two men, and a night shift of two watchmen. The maintenance of the stable cost \$14,814 in 1912, of which \$5,681 was for labor, \$1,410 for horse-shoeing, \$6,502 for feed and medical attention, and \$1,043 for harness repairs and stable supplies. Forty head of horses were kept by the department, at an average cost of \$339.82 per head.

The total equipment of the department was 21 wagons, 10 sweepers, 15 sprinklers and 6 flushers. Ten crews were employed, containing a total of 71 laborers, in addition to the 52 drivers.

#### STREET CLEANING IN SCHENECTADY.

The system of street cleaning that is now being followed in Schenectady, N. Y., is a pick-up hand-cart patrol system and pressure sprinkling system. About sixty men patrol the paved streets, each of which is equipped with approximately ten corrugated, Number 180, Canco cans, a hand cart, broom, pan and shovel. These men fill the cans, cover them and put them on the curb, and then start out again with an empty can. The cans are emptied daily by an auto truck that collects these street droppings, and dumps them at the premises of property owners who have requested same for their gardens or takes them to an authorized dump.

This patrol hand broom system takes up only the heavy dirt, leaving the fine dust, that is such a nuisance to the travelling public on a windy day, to be flushed from the streets by the flushing crews. There are three flushing crews, two day crews and one night crew, the night crew operating in the business section. Each crew consists of two teams, two drivers, two flushers, and one gang boss who opens and closes the hydrants and has a broom for sweeping cross walks and relieving congested places in the gutter.

There are in the city 42 miles of sheet asphalt, 6 miles of brick, 2 of asphalt block, 2 of granite block and 6 of all other pavements.

For the above information we are indebted to Charles A. Mullen, commissioner of public works.

#### FREQUENCY OF CLEANING STREETS.

One of the tables in this issue gives information concerning the frequency of cleaning streets by several score of cities of all sizes. The latest data of this kind published by the Census Bureau for cities of more than 30,000 population shows the frequency of cleaning by the different methods to be as indicated in the accompanying table.

From this table we see that in the largest cities more streets are cleaned by hand seven or more times a week than at any other rate; while five or six times a week is the prevailing rate in all the other groups; and in each group of cities three or four hand cleanings a week is reported by the smallest number. Machine cleaning is reported as employed once or twice a week by more cities in each group than any other rate, while the second

Average Number of Cleanings per Week.

Method.	All cities.	Group I.	Group II.	Group III.	Group IV.
Hand .....	5.4	5.6	5.3	4.9	5.1
Machine .....	2.8	3.0	2.8	2.7	2.4
Flushing .....	2.3	1.8	3.0	2.8	2.0

Relative Frequency of Cleaning Streets by Different Methods. From the 1909 Census.

Method.	All cities. Times per week				Cities of 300,000 or over. Times per week				Cities of 100,000 to 300,000 Times per week				Cities of 50,000 to 100,000. Times per week				Cities of 30,000 to 50,000. Times per week			
	1 or 2	3 or 4	5 or 6	7 or more	1 or 2	3 or 4	5 or 6	7 or more	1 or 2	3 or 4	5 or 6	7 or more	1 or 2	3 or 4	5 or 6	7 or more	1 or 2	3 or 4	5 or 6	7 or more
Hand .....	3	4	1	2	3	4	2	1	2	4	1	3	2	4	1	3	2	4	1	3
Machine .....	1	3	2	4	1	3	2	—	1	2	4	3	1	3	2	4	1	3	2	4
Flushing .....	1	3	2	4	1	3	2	—	1	2	4	3	1	3	2	4	1	2	3	—

largest number report machine sweeping five or six times a week in each group except the second. Flushing also is reported as employed only once or twice a week by the majority of cities in each group.

Considering the average number of cleanings per week by each method in each of the groups, we find the average number of hand cleanings per week to be 5.6 in group I, while the minimum is 4.9 in group III; variation between the different groups being very slight. Machine cleaning varies from a maximum of 3 per week in group I to 2.4 in group IV, and flushing from 1.8 times a week in group I to three times a week in group II.

Taking all the cities, we find the total area subject to hand sweeping only to be 69,826,843 square yards; that subject to machine sweeping only, 57,130,669 square yards; that subject to both hand and machine sweeping, 29,125,929 square yards; both hand or machine sweeping and flushing, 17,024,376; and that subject to flushing only, 16,348,277 square yards.

The amount of street sweepings per year were reported as follows: Group I, .03867 cubic yards per square yard subject to cleaning. The area cleaned includes 49.5 per cent of all pavements. In group II, the street sweepings amounted to .02371 cubic yards per square yard subject to cleaning. The area cleaned comprised 36.8 per cent of all the paved streets. In group III, the sweepings amounted to .02227 per square yard subject to cleaning. The area cleaned comprised 42.7 per cent of all the paved streets. In group IV, the sweepings amounted to .03317 per square yard subject to cleaning. The area cleaned comprised 28.6 per cent of all paved streets.

The average costs of street cleaning in the several groups, including all pavements, was as follows: Group I, 14¼ cts. per square yard, subject to cleaning, or \$527.29 per 1,000 inhabitants. Group II, 7 cts. per square yard subject to cleaning, or \$448.84 per 1,000 inhabitants. Group III, 5.85 cts. per square yard, subject to cleaning, or \$404.58 per 1,000 inhabitants. Group IV, 4.7 cts. per square yard subject to cleaning, or \$280.11 per 1,000 inhabitants.

The cost of collecting and disposing of all refuse in group I was \$355.29 per 1,000 cubic yards; in group II, \$626.17 per 1,000 cubic yards; in group III, \$570.10 per 1,000 cubic yards, and in group IV, \$545.94.

The amount of ashes collected in the first group was about three times as much as the garbage; in the second group 0.9 as much, in the third group 1.1 as much, and in the fourth group 0.9 as much. That is, in all except the largest cities the amount of ashes was practically the same as that of garbage (compared by volumes rather than by weights), but three times as great in the largest cities. Probably this is to be accounted for by the greater prevalence in the smaller cities of the custom of permitting property owners to dispose of their own ashes, whereas in the largest cities there are few dumps or other facilities for this, and it is necessary that the ashes be removed either by the city or by some other regular collectors.

#### DAY OR NIGHT COLLECTION OF WASTES.

From paper before American Public Health Association by WILLIAM H. EDWARDS, Commissioner of Street Cleaning, New York City.

Un sightliness of cans of ashes and garbage standing in front of buildings is much less evident at night than in the daytime. The retention of the cover on the receptacle is easier in the daytime in that animals do not prowl about and persons who find pleasure in displacing the covers do not find it convenient to do so when they are observed. Where by carelessness or malice the covers are removed, the day work has its disadvantage in the spreading by the wind of dust from the ashes or

the generation of noxious odors by the sun's effect upon the garbage.

At best, the receptacle is some obstruction to pedestrians, and therefore is much less a disadvantage in the daytime than at night. Interference with regular traffic by vehicles whose work causes them to stop and start frequently and at times to cross the street is also considerable.

Where receptacles are placed within an areaway there is disadvantage in night collection owing to the difficulty which the collector experiences in seeing whether there is material to remove or not.

The noise of emptying of the receptacle into the cart or truck is necessarily more objectionable at night. The noise of vehicular traffic, while of no great importance in the daytime, becomes of considerable importance during the sleeping hours.

The effect of the intense heat of the sun radiated from the pavements in the summer time is a distinct drawback both to men and animals in day collection and is completely obviated in night collection. The spilling of material from the vehicles is likewise disadvantageous in day collection and is of small comparative importance in night collection, as arrangement can be made for the sweeping up of the litter before the use of the streets in the day time.

When the materials collected arrive at the dumping point at night there is a charge to be made for the necessary lighting, which is an economic disadvantage.

During the whole process of collection the one particular disadvantage of night work comes from the fact that supervision of the work is made considerably more difficult than where the supervising officer has the advantage of broad daylight.

I am convinced that night collection should be chosen in the case of New York.

#### GARBAGE COLLECTION AND PAPER BALING

Duplicate Can System of Garbage Collection—Baling Paper with a Portable Press at Evanston, Ill.

By H. H. SHERER, Superintendent Streets.

Up to the present time the city of Evanston, Ill., has collected garbage from over 4,000 residences within her boundaries. This territory has been served by nine men, each with a single horse and bottom board wagon. Considerable fault has been found at times with these wagons, attention having been called to the leakage as well as to the offensive odor emanating from them. Canvas covers were used, being pulled over the loads as the wagons filled, but these covers soon became saturated and were hard to clean. For these reasons a new method seemed desirable, and after some discussion by the Public Works Department, under J. H. Moore, the duplicate can system has been installed among 75 of the

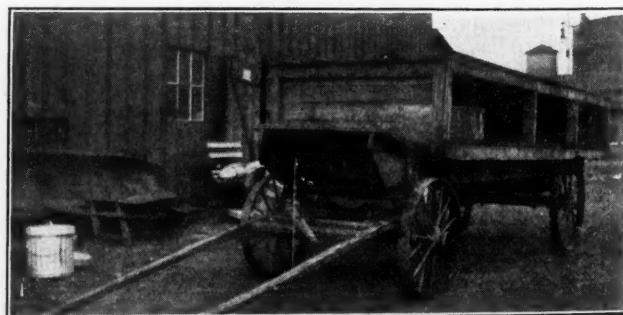


FIG. 1. WAGON FOR CARRYING GARBAGE CANS. Body constructed by city labor, mounted on old gear.



residents in the northwest section of the city, the farthest from the disposal station of any route which might have been selected, this to provide a rigid test.

Seventy-five subscribers to the system were solicited in a moderately restricted area, who were to pay \$2.00 for a term of five months.

The city immediately purchased 150 covered garbage cans, 14 inches high by 14 inches in diameter, of approximately eight gallons capacity. Using the gear of a low single-horse wagon, a carpenter and laborer in one day built up a double-decked wagon with a capacity of 78 cans, as shown in the accompanying illustration. Each tier holds 40 cans in four longitudinal rows of 10 each. To keep the cans in place, in the middle of each deck an inch strip is nailed to the floor from front to back, and other strips are placed from side to side, dividing each row into ten sections. The edges are built up an inch above the floor of each deck and are covered with angle iron. The driver's seat is provided by leaving out the two front center cans of the upper deck.

To expedite collection, and to insure that subscribers and no others benefited by the service, white cards, 6x9 inches, with "Special Garbage Service" in heavy black letters and the house number inserted at the bottom were tacked to alley fence or gate.

Service was started in August and is given three times a week. The collector leaves the city yard with 75 empty cans and at each house where the card has been



FIG. 2. SIMILAR WAGON USED IN MANSFIELD, MARION AND CANTON, OHIO.

placed an empty can is left, the used can taking its place on the wagon without the cover being lifted. When a load of filled cans has been replaced with empties, the wagon is brought to the disposal station, where the garbage is cremated in summer or given to farmers for hog feed in winter.

The emptied cans are placed immediately on two racks holding 24 each in two tiers, with the mouths of the cans tilted down. They are then given a thorough cleaning with live steam from a boiler placed under shelter in the crematory. From the steam bath the cans are passed into a 1:100 solution of disinfectant, which is contained in a galvanized iron vat fitted with a drain which is connected with the basin in the crematory. A half a minute's time with the steam hose and another half minute in the disinfectant bath is sufficient to produce a thoroughly cleansed receptacle.

The operation of the wagon costs \$2.00 per half day for the teamster and horse, and the disinfectant costs \$1.00 per gallon. One-half gallon of disinfectant does for two baths. The garbage cans cost \$9.00 per dozen. The total cost for twenty-two weeks from August 1 to December 31 for 75 subscribers will be as follows:

Teamster and horse ½ day, 3 times weekly for 22 week, at \$4.00 per day.....	\$132.00
Time of crematory man (assisting in washing cans), 1 hour, 3 times weekly for 22 weeks, at \$.30 per hour .....	19.80

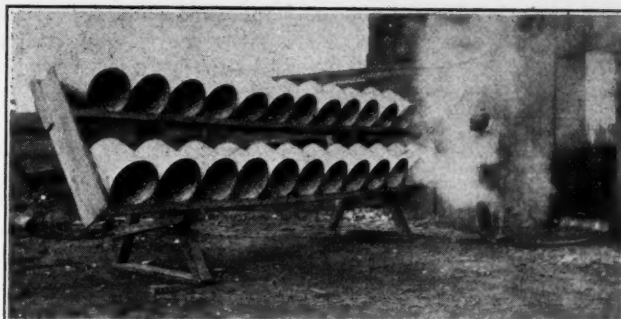


FIG. 3. CLEANING CANS WITH STEAM.

½ cost of 156 cans, at \$9.00 per doz., considering life of can 15 mos. and this test being of 5 mos. duration .....	39.00
2 tons coal, at \$6.50.....	13.00
16½ gallons disinfectant, at \$1.00.....	16.50
Total cost .....	\$220.30

The preceding figures, it will be noted, show merely operating expenses and do not take into account the depreciation on the wagon. Indications are that cans should last fifteen months or more. It is therefore evident that the per capita cost of such collection would approximate \$3.00 for the term of five months, or close to \$7.20 for twelve months. One man could take care of four such routes as above three times weekly. Where the unproductive mileage is less than in this case and the stops closer together, a man should easily take care of 450 residents in first-class shape.

By this method the garbage does not stand long enough to putrefy; does not adhere to cans so that it cannot be dislodged, and there are no flies at any stage of the collection. Since the institution of this system there has been no adverse criticism of the garbage collection in this territory. In all, seven receptacles have been misplaced or stolen. As we extend the proposition throughout the city we will have some mark of identification stamped into as well as stenciled on the garbage can.

#### PAPER BALING.

On account of the location of the municipal dump at Evanston, the question of collection and disposal of paper is a serious one. We have a frontage of approximately four miles on Lake Michigan. A considerable portion of this shore line has been used at one time or another for the disposal of the city's ashes, cans, paper and other refuse, except garbage. Besides being



FIG. 4. FILLING PRESS, WHICH IS MOUNTED ON REAR STEP OF WAGON.

poor material for filling, the paper has caused extreme annoyance when separated from the more solid wastes, blowing over lawns and streets in the proximity of the dump, always very unsightly and frequently frightening horses.

To correct this situation a baling press has been put in service with excellent results. The press is made of steel and weighs about 300 pounds. To operate economically the press was mounted on the step of an old exercise wagon of the fire department.

It appeared that the bulk of the paper was to come from three business districts, and the merchants were asked to place all waste paper and cardboard boxes in 2½-bushel gunny sacks, costing 10 cents each. The plan was put in operation in three business districts on successive days. Notice had previously been given by an inspector that this collection would be made the same day each week, and the instructions given to place the bag on a nail just inside the alley gate or side of the barn or stable, as the case might be, on the morning of the designated day.

The wagon is driven over the route, a bag emptied into the open mouth of the press, the empty bag placed

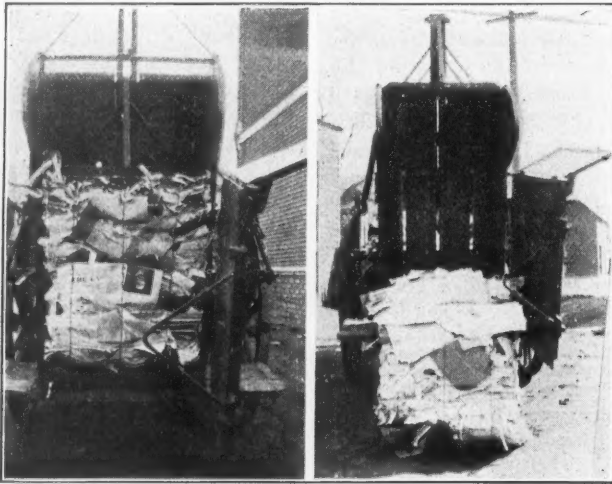


FIG. 5. BALER OPENED BALE WIRED AND THROWN READY TO EJECT BALE. OUT OF PRESS.

back on the nail, and the wagon moves on to another bag. When the paper shows in the press the lever, operated from inside the wagon, is brought into play, the paper is compacted, and the process repeated until a full bale is under compression, when the wire (we use common hay wire from our stables) is drawn taut around the mass through grooves in the frame of the press, and the completed bale thrown out.

The bales of paper are about 18 inches by 24 inches by 32 inches and vary in weight from 80 to 100 pounds, though some tip the scales as high as 120 pounds when a considerable number of magazines or cuttings from printing shops or similar already compacted paper makes up the bulk.

Two of these bales by actual test made up a 2 cubic yard wagonload of loose paper. Six loads of rubbish per day is the average for the 2 cubic yard wagons from the district in which the press operates.

Following its installation in the business district, the service was extended to the residence portion of the town lying between the elevated railroad and the lake. This territory comprised the routes of six rubbish men—in all, some 48 miles of alleys. Therefore this press takes a day's work each week from the routes of each of six men who cover the east side of the city for rubbish. This permits them to increase the service to all in their district with the added advantage of having far less loose papers blowing down the alleys to the

street corners to litter the gutters and startle the horses.

An ordinary laborer at \$2.40 per day of eight hours drives the wagon and presses the paper, averaging 12 bales of 80 pounds each per day. At 30 cents per 100 pounds, the selling price of paper, it will be noted that \$57.60 per month may be turned over to the city collector. This will pay for the operation of the press and leave a balance to aid the rest of the service.

Experience has suggested to us that a horizontal press mounted on a very low wagon may facilitate the work to an appreciable extent. We know of no such press obtainable at present.

#### COLUMBUS REFUSE COLLECTION NOTES.

The following paragraphs are taken from the annual report for 1912 of E. W. Stribling, superintendent of the Refuse Collection Department of the City of Columbus, O.

Over 50 per cent of the complaints made are the result of failure on the part of the public to observe rules governing garbage and refuse collection. The result is increased expense to the city in operating the department.

In enforcement of rules the department uses as much leniency as possible, the collectors being instructed, whenever they see violation of rules, to notify occupants of premises to comply with rules. Collection of waste is not refused on the first offense. If, on his next collection, he finds no attempt has been made to correct the violation, no collection is made. The department has found this method the only effective way of enforcing the rules.

In January and February of this year there was a great number of complaints for non-collection of garbage and rubbish. This condition was due to no fault of the department, as a severe winter made impossible a regular collection. In frozen periods of this kind the collector can only cover about one-fourth of his route each day, and in the section that he does collect can only remove about one-half the rubbish and garbage, as the other half is frozen so hard it cannot be removed from the cans. When this condition arises there is nothing to do but wait until a thawing out period sets in and then to increase the number of teams in use. If additional teams were to be put on when the weather is severe the result would be a large expenditure of money by the city without relieving the conditions, as the garbage and rubbish could not be removed from the cans.

The citizens can help to relieve the condition in the winter months and save themselves inconvenience of having their cans broken up by draining garbage before placing it in the receptacles and keeping a lid on garbage and rubbish receptacles.

The cost of collection has been reduced 2c per ton over 1911, in spite of the fact that the cost of feed increased 33 1-3 per cent, and a severe winter made necessary the employment of additional teams to collect garbage, without increasing the weight.

The rubbish collection service is entirely inadequate but with the amount of equipment owned by the department this limited service is the best that can be given. To have a thorough collection, rubbish must be moved at least every two weeks.

The question of disposing of the rubbish is a serious matter, as what dumps the city has been using are about filled. This will be relieved by the construction of an incinerator and utilization plant for the disposal of rubbish, which will be constructed the coming year.

The department collected 24,942 loads of rubbish in 1912, an increase of 10,229 loads over 1911. The cost per load is \$1.92, a reduction of 54c over 1911.



**REFUSE COLLECTION WAGONS.**

The following notes concerning wagons used in collecting refuse are from data furnished by municipal officials:

Denver, Colo., uses for garbage a 2-ton iron tank drawn by two horses, and provided with tight lids. Collectors in Pueblo, Colo., must use wagons with wooden or metal covers. In Bridgeport, Conn., covered metal dump wagons are used. In Hartford, Conn., 400-gallon Haywood with canvas covers. New Britain, Conn., metal lined wagons with wooden covers for garbage; dump wagons with canvas covers for ashes and rubbish. Washington, D. C., uses for garbage steel removable bodies with steel covers holding 2 cubic yards; for ashes, 3, 4 and 5-cubic yard wagons of wood covered with canvas, bottom dump. Evanston, Ill., bottom board wagons covered with tarpaulin from which the garbage is shoveled out. Oak Park, Ill., steel self dumping wagons of 1 2-3 and 3 cubic yards capacity, having steel lids; for ashes, 4-wheel centre-dump wagons of 3 cubic yards capacity. Logansport, Ind., 3,000-pound iron tank, covered. Cedar Rapids, Iowa, 2-cubic yard steel wagons with steel covers. Cambridge, Mass., for rubbish, crank axle, lattice side 4½ cubic yards. Ann Arbor, Mich., 100-gallon steel tank wagon with hinged metal covers, emptied by shoveling. Kalamazoo, Mich., collects garbage on the duplicate can system, in wagons with racks; ashes and rubbish in ordinary dump wagons. Mankato, Minn., iron covered iron tank wagon for garbage, dumped through door at the end. Kansas City, Mo., 700-gallon metal tank with a wooden top. Elizabeth, N. J., mixed rubbish collected in 3-yard and 4-yard bottom dumping wagons with canvas covers. Trenton, N. J., 2½-ton wagons with burlap covers, back dumpers, bottom dumpers, and two emptied by drags. Hudson, N. Y., 3 1-cubic yard watertight tanks on each wagon for garbage. Rochester, N. Y., 3-yard steel wagons with canvas covers dumped by tipping, for garbage; for ashes, 4-yard and 5-yard, bottom dump; for rubbish, 15-yard, cable

haul dump. Cleveland, Ohio, for garbage, 70-cubic foot metal box, canvas covered, rear dump; for ashes and rubbish, 3½-yard bottom dump. Columbus, Ohio, for garbage, canvas covered wagons dumped by hoist. Youngstown, Ohio, iron wagon, canvas covered, hinged end, front end raised by windlass. Chester, Pa., for garbage, 3-ton iron wagon, canvas covered, bottom dump. Homestead, Pa., for all refuse, 3-ton Packard automobile truck, having a box bed lined with galvanized iron; covered with tarpaulin, dumped by hand crank. Providence, R. I., for garbage, 2-ton and 3-ton steel wagons; wooden covers, emptied by shoveling. Charleston, S. C., for all refuse, steel dump carts covered with tarpaulins. Salt Lake City, Utah, for mixed refuse, regular farm wagon with canvas covers. Danville, Va., for garbage, 2-wheel dump carts with extra sideboards. Cheyenne, Wyo., for ashes, ordinary wagon box 3 cubic yards capacity with bottom of 2 x 4's lined with sheet iron, dumped by removing bottom poles.

Concerning the frequency of washing wagons, the following is reported:

Washing daily with hose: Bridgeport, Conn.; Evanston, Oak Park and Springfield, Ill.; Butler and McKees Rocks, Pa.. Daily, method not named: Washington, D. C.; Westfield, Mass.; Ann Arbor, Mich.; Cleveland and Youngstown, O.; Chester, Pa.; Salt Lake City, Utah. Lima, O., daily, with hot water. Charleston, daily, scraped out. Pueblo, Colo., two or three times a week. Cedar Rapids, Iowa, twice daily. Cambridge, Mass., twice daily, water and broom. Lawrence, Mass., weekly, by hose. Mankato, Minn., twice a week, by hose. Vicksburg, Miss., weekly. Trenton, N. J., (garbage wrapped) "not necessary to wash." Asheville, N. C., twice a day. Columbus, O., weekly. Homestead, Pa., once or twice a week. Providence, R. I., after each load, by hose. Columbia, S. C., (mixed refuse) not washed. Wheeling, W. Va., washed with steam hose after each load. La Crosse, Wis., after each load. Those not named either did not make any statement, or said that the washing was done whenever necessary or at irregular intervals.

**DISPOSAL OF MUNICIPAL REFUSE**

**Methods of Disposing of Garbage Employed by One Hundred Cities.—Reduction at Columbus, Ohio in 1912.—**

**Refuse Disposal Notes.—Weights of Different Classes of Refuse in Several Cities.**

The methods reported as being employed for disposing of garbage in the various cities are as follows:

Denver, Colo., fed to swine outside city. Bridgeport, Conn., Fisher Deduction Plant. Hartford, Conn., sold to farmers or burned. New Britain, Conn., fed to swine or plowed. New Haven, Conn., fed to swine or composted. Washington, D. C., reduction, Chamberlain process. Evanston, Ill., cremation. Oak Park, Ill., cremation. Springfield, Ill., McGuire incinerator, also dumps outside city. Fort Wayne, Ind., Dixon incinerator. Logansport, Ind., fed to swine. Richmond, Ind., Dixon incinerator. Cedar Rapids, Iowa, dumped into river. Cambridge, Mass., farmers for swine. Lawrence, Mass., sold for \$2,000 a year. New Bedford, Mass., reduction. Westfield, Mass., fed to swine. Ann Arbor, Mich., fed to swine and fertilizer. Kalamazoo, Mich., dumped on farms. St. Cloud, Minn., fed to swine. Kansas City, Mo., fed to swine. Trenton, N. J., Davis incinerator. Rochester, N. Y., reduction. Cleveland, Ohio, reduction. Columbus, Ohio, reduction. Lima, Ohio, burned. Lorain, Ohio, reduction and swine. Youngstown, Ohio, reduction. Butler, Pa., Morse-Boulger incinerator. Chester, Pa., to swine. Homestead, Pa., Dixon incinerator. Meadville, Pa., Dixon incinerator. Oil City, Pa., Dixon incinerator. Warren, Pa., incinerator. Providence, R. I., fed to swine. Charleston, S. C. (combined refuse) dumped

on salt marsh. Columbia, S. C. (combined refuse) dumped on low land. Jackson, Tenn. (combined refuse) dumped outside city. Salt Lake City, Utah (combined refuse) city dump. Danville, Va., dumped in river. Walla Walla, Wash., fed to swine. Wheeling, W. Va., Decarie incinerator. La Crosse, Wis., dumped in river. Cheyenne, Wyo., dumped in gully at edge of town.

Ashes and rubbish are disposed of as follows: Denver, Colo., city dumps, low ground and grading streets. Hartford, Conn., on lowlands. New Britain, Conn., on lowlands. Washington, D. C., ashes to low ground, rubbish to incinerator, salable portions picked out on conveyor and sold. Evanston, Ill., dumped at lake front. Oak Park, Ill., ashes in lowlands and grading streets, rubbish to dump in river bottom. Springfield, Ill., rubbish to incinerator. Logansport, Ind., ashes in lowland, rubbish burned in open fires. Richmond, Ind., combustible burned, incombustible on low ground. Cambridge, Mass., ashes on low ground, rubbish in Vulcan and Jarvis incinerators. Lawrence, Mass., filling low ground. New Bedford, Mass., dumps. Westfield, Mass., ashes, for filling. Ann Arbor, Mich., low ground. Kalamazoo, Mich., combustible burned, other on low ground. St. Cloud, Minn., low ground. Kansas City, Mo., on river bank. Trenton, N. J., incombustible on dumps, combustible to incinerator. Rochester, N. Y., ashes to dumps, rubbish

to Decarie incinerator, and salable materials sorted out. Asheville, N. C., low ground. Cleveland, Ohio, low ground. Columbus, Ohio, on dumps. Lorain, Ohio, on dumps. Butler, Pa., low ground and garbage furnace. Chester, Pa., on dumps. Jackson, Tenn., on dumps. Walla Walla, Wash., filling along creek banks and low ground Cheyenne, Wyo., in gully.

In addition to the above, the following information concerning methods of disposing of garbage has been obtained from other sources, chiefly from former issues of Municipal Journal:

Incinerating plants or crematories are used at Birmingham, Ala.; Berkeley and Pasadena, Cal.; Jacksonville and Tampa, Fla.; Atlanta and Macon, Ga.; Topeka, Kan.; Lexington and Louisville, Ky.; Detroit, Mich.; Minneapolis, Minn.; Atlantic City and Paterson, N. J.; Saranac Lake, N. Y.; Muskogee, Okla.; Portland, Ore.; Easton, Erie, and Johnstown, Pa.; El Paso, San Antonio, Wichita Falls, Tex.; Lynchburgh, W. Va.; Seattle and Spokane, Wash.; Elkins, W. Va.; Milwaukee and Racine, Wis.; and Winnipeg, Man.

Reduction is employed at Boston, Mass., and Philadelphia, Pa.

Garbage is taken to sea by Oakland, Sacramento and San Diego, Cal.; is dumped in rivers by St. Louis, Mo., and Niagara Falls, N. Y.; and is dumped on land by Moline, Ill.; Huntington, Ind.; New Orleans, La.; St. Paul, Minn.; Montclair and Plainfield, N. J.; Schenectady, N. Y.; Williamsport, Pa.; and Dallas, Tex. It is fed to swine by Worcester, Mass., and Grand Rapids, Mich.

According to the latest U. S. Census, that for 1909, the figures for cities of 30,000 population and over give the total number of cubic yards of garbage disposed of by incineration as 535,429; by reduction, 2,418,036; by feeding to swine, 447,136; by dumping on land, 269,855; by burying, 157,981; by dumping in water, 341,523. From this it appears that, according to these figures, considerably more than half of the garbage collected in cities of more than 30,000 population is disposed of by reduction. The accompanying table shows the figures in detail. From this it is apparent that the preponderance of figures for reduction is due to the fact that this method is employed almost exclusively in the few largest cities of the country.

#### COLUMBUS GARBAGE REDUCTION.

The garbage reduction plant of Columbus, Ohio, was described in our issues of March 16, 1910, and November 15, 1911. During the year 1912 the drying equipment was changed from steam to direct heat for drying all the material. This consisted in removing two vacuum mixing dryers, the installation of one direct heat dryer with necessary furnaces and chambers and the rebuilding of the revolving steam dryer. The drying equipment was changed by the contractor who made the original installation to complete the contract and the city was put to the additional expense of constructing foundations and the labor required in rebuilding the revolving dryer. The changes made have resulted in doubling the capacity of the drying equipment and permits the drying of all material during the day shift of 8 hours, and at less cost for labor and fuel. In connection with these changes, tests were made of the treatment of gases and methods were developed for deodorizing them. Deodorizing condensers have been installed and provision made for deodorizing all gases in high temperature furnaces.

A percolating plant was placed in operation in January, 1912, and has given very satisfactory results. Previous to the operation of the percolator the only recovery of grease was made by pressing, so that the material when dry contained approximately 10 per cent of the grease which was not recovered. During 1912 all sol-

ids were percolated and the yield of grease from the plant increased approximately 40 per cent. Last year 203½ tons of grease were recovered by percolation, while the year previous about 140 tons had been recovered. The percolating plant cost approximately \$20,000, and the cost of operating the plant, including fuel, labor, gasolene and supplies, amounted to \$4,602. There was received for the grease \$16,891, giving a profit of \$12,289 for the grease.

The operating results for 1912 and those for 1911 are given in the accompanying table. These figures do not include a fixed charge for interest and depreciation. Interest on bonds amounted to 4 per cent and sinking fund for the average life of the plant would be 3.36 per cent. As repairs and renewals are charged to operation, a fixed charge of 7.36 per cent on the original cost of \$210,000 amounting to \$15,456 would be sufficient; which, if deducted from receipts, would show an earning over and above all charges. The results for 1912 would have made a much better appearance had not the market price received for the byproducts been greatly decreased. Had the same prices prevailed in 1912 as were received in 1911, the total receipts would have been increased by \$13,000, with the same cost for operation.

The above information is obtained from the annual report for 1912 of Irwin F. Osborn, engineer in charge of design and construction.

#### OPERATING RESULTS, COLUMBUS GARBAGE REDUCTION PLANT, 1912 and 1911.

	Garbage Reduced.	
	1911 Tons	1912 Tons
January .....	1,063.08	1,224.64
February .....	977.03	1,048.87
March .....	1,114.75	1,172.55
April .....	1,175.22	1,221.91
May .....	1,364.05	1,373.64
June .....	1,371.39	1,353.52
July .....	1,613.47	1,808.30
August .....	2,147.44	2,295.57
September .....	2,270.71	2,425.47
October .....	1,719.28	1,842.35
November .....	1,355.59	1,550.74
December .....	1,361.88	1,471.91
Totals .....	17,533.88	18,789.47
Average tonnage per day	56.56	60.03

#### Expenditures and Receipts.

Expenditures and Receipts.		
Expenditures:	1911	1912
Supervision and labor.....	\$21,680.58	\$24,170.86
Coal .....	5,964.58	7,442.73
Electric power .....	1,921.45	1,305.95
Repairs and renewals.....	1,305.36	1,717.73
Supplies .....	882.26	3,163.09
Office expense .....	271.21	181.01
Chemical analysis .....	290.45	223.00
Miscellaneous .....	166.37	299.32
Total cost of operation..	\$32,482.26	\$38,503.69
Receipts from Products:		
Grease .....	\$34,324.54	\$42,559.52
Tankage .....	23,163.64	17,537.04
Hides .....	1,217.07	1,544.49
Miscellaneous .....	16.50	87.57
Total .....	\$58,721.75	\$61,728.62
Receipts over expenditures....	26,239.49	23,224.93
Revenue per ton garbage reduced	3.35	3.29
Operating cost per ton.....	1.85	2.05
Receipts over expense per ton..	\$1.50	\$1.24

#### REFUSE DISPOSAL NOTES.

Hartford, Conn., sells paper collected by it at \$3.50 a ton.

Oak Park, Ill., burns its garbage in the crematory, which is in the geographical center of the village, the cost of burning in 1912 being 64.04 cents per ton and that of collection 74.08 cents per ton, these including cost of repairs and renewals. An average of 185 pounds



of coal was used for each ton of garbage consumed.

Homestead, Pa., owns a Dixon furnace with a capacity of 30 tons in 24 hours. Three men are employed at the furnace, one at \$2.75 for ten hours, and the others at \$2.25 for nine hours. The refuse is collected in a 3-ton Packard automobile truck, which cost \$3,900. This truck makes three loads each day. Beside the chauffeur, there are five helpers, three of which go ahead and set the cans out on the curb. The chauffeur receives \$85 a month, and the helpers \$2.25 a day of nine hours.

Meadville, Pa., burns garbage and rubbish in a Dixon incinerator of 25 tons capacity. The cost of operating this in 1912 was 61 cents per ton.

Oil City, Pa., until six weeks ago, operated a Davis crematory at a cost of about \$2,800 a year for operation and maintenance. A contract has just been signed under which the city is to receive \$50 annual rental for this plant, the contractors to operate and maintain the same. The contractors are the largest collectors of garbage in the city, and they have the privilege of charging all

other collectors 75 cents per ton for garbage brought to the furnace.

Wheeling, W. Va., operates a Decarie incinerator.

The following were reported as the average weights of a cubic yard of the several classes of refuse:

AVERAGE WEIGHTS IN POUNDS PER CUBIC YARD.

City	Garbage	Ashes	Rubbish	Mixed refuse	Ashes and rubbish	Garbage and rubbish
Washington, D. C.	1,150	1,200	171	....	....	....
Cambridge, Mass.	850	1,150	250	....	....	....
St. Cloud, Minn.	1,500	....	....	....	....	....
Elizabeth, N. J.	....	....	....	1,040	....	....
Rochester, N. Y.	727	900	183	....	....	....
Cleveland, O.	1,500	....	....	....	900	....
Chester, Pa.	....	2,000	....	....	....	....
Charleston, S. C.	....	....	....	{ 1,000 to 1,600 }	....	....
Columbia, S. C.	....	....	....	800	....	....
Salt Lake City	....	....	....	900	....	....
Danville, Va.	....	....	....	....	....	500

### CUBIC YARDS OF GARBAGE DISPOSED OF BY EACH METHOD. CITIES OF MORE THAN 30,000 POPULATION.

From the Statistics of Cities of the U. S. Census Bureau for 1909.

City	Dumping on land		Dumping in water		Feeding to swine		Burial By city employees	Reduction		Incineration	
	By city employees	By contractors	By city employees	By contractors	By city employees	By contractors		By city employees	By contractors	By city employees	By contractors
New York	17,220	....	....	....	....	....	....	....	577,228	23,600	....
Chicago	....	....	....	....	....	....	....	....	186,536	....	....
Philadelphia	....	....	....	....	....	....	....	....	651,360	....	....
St. Louis	....	....	....	....	....	....	79,293	....	2,230	....	....
Boston	....	....	....	....	....	13,444	....	....	92,151	....	....
Baltimore	....	....	....	....	....	....	....	....	152,608	....	....
Cleveland	....	....	....	....	....	....	....	71,344	....	....	....
Pittsburgh	....	....	....	....	....	....	....	....	136,004	....	....
Detroit	....	....	....	....	....	....	....	....	50,260	....	....
Buffalo	....	....	....	....	....	....	....	....	50,564	....	....
Cincinnati	....	....	....	....	....	....	....	....	53,694	....	....
Milwaukee	....	....	....	....	606	....	20,424	....	....	61,928	....
Newark, N. J.	....	....	....	....	....	....	....	....	38,706	....	....
New Orleans	....	....	181,666	....	....	....	....	....	72,110	....	....
Washington	....	....	....	....	....	....	....	....	....	36,807	....
Minneapolis	....	....	....	....	....	....	....	....	....	48,667	....
Los Angeles	....	....	....	....	....	....	....	....	....	....	....
Kansas City, Mo.	....	....	....	35,083	....	21,345	....	....	....	....	....
Indianapolis	....	....	....	....	....	....	....	....	48,000	....	....
Louisville	51,304	....	....	....	....	....	....	....	....	....	....
Seattle	30,888	....	....	....	....	....	....	....	....	....	....
Providence	....	....	....	....	....	32,415	....	....	....	....	....
Rochester	....	....	....	....	....	....	....	....	66,329	....	....
St. Paul	....	....	11,031	....	8,289	....	....	....	....	....	....
Denver	....	....	....	....	....	80,392	....	....	....	....	....
Portland, Ore.	1,840	....	....	....	....	....	....	....	....	16,241	....
Columbus	....	....	....	....	....	....	30,000	....	....	....	....
Toledo	12,375	....	....	....	....	....	....	....	....	....	....
Worcester	....	....	....	....	13,522	....	....	....	23,264	....	....
Syracuse	....	....	....	....	....	....	....	....	....	....	....
New Haven	....	....	....	....	....	27,000	....	....	....	....	....
Scranton	....	....	....	....	....	....	....	....	....	8,155	....
Paterson	....	....	....	....	....	....	....	....	14,400	....	....
Fall River	....	5,000	....	....	....	....	....	....	....	....	....
Memphis	....	....	....	....	....	....	....	....	....	28,780	....
Richmond, Va.	2,689	....	....	....	....	....	....	....	....	9,759	....
Oakland	....	....	76,572	....	....	....	....	....	....	....	....
Grand Rapids	....	....	....	....	20,043	....	....	....	....	3,957	....
Nashville	....	....	7,000	....	8,056	....	....	....	....	....	....
Lowell	....	....	....	....	7,106	....	....	....	....	2,601	....
Cambridge	....	....	....	....	26,330	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....	15,891	....	....
Bridgeport	....	....	....	....	....	....	....	....	15,625	....	....
Spokane	....	....	....	....	....	....	....	....	....	27,280	....
Hartford	....	17,100	....	....	....	17,275	....	....	....	....	....
Reading	....	....	....	....	....	....	....	....	14,048	....	....
Trenton	....	....	....	....	....	....	....	....	....	20,552	....
San Antonio	13,104	....	....	....	....	....	....	....	....	....	....
New Bedford	....	....	....	....	....	....	....	....	11,411	....	....
Camden	....	....	....	....	....	....	....	....	....	576	....
Dallas	....	....	....	....	....	....	....	....	....	16,425	....
Lynn	....	....	558	....	11,533	....	....	....	....	....	....
Springfield	....	....	....	....	8,489	....	....	....	....	....	....
Wilmington	....	....	....	....	....	....	....	....	9,288	....	....
Lawrence	....	....	....	....	5,467	....	....	....	....	....	....
Troy	....	....	....	....	....	....	....	....	....	....	1,083
Yonkers	....	....	....	....	....	....	....	....	....	26,100	....
Youngstown	....	....	....	....	....	....	....	....	....	7,702	....
Duluth	....	....	....	....	....	....	....	....	....	9,070	....
Houston	....	....	....	....	....	....	....	....	....	51,480	....
Somerville	....	....	....	....	11,850	....	....	....	....	....	....
Utica	....	....	....	....	....	....	....	....	14,085	....	....
Waterbury	....	....	....	....	....	....	....	....	....	....	13,904
Manchester	....	....	....	....	....	1,050	....	....	....	....	....
Evansville	....	....	....	....	438	....	....	....	....	2,759	....
Norfolk	3,798	....	....	....	....	....	....	....	....	10,256	....
Wilkes-Barre	....	....	....	....	....	....	....	....	....	....	1,627
Savannah	....	....	....	....	53,226	....	....	....	....	....	....
Harrisburg	....	....	....	....	....	....	....	....	16,500	....	....
Fort Wayne	....	....	....	....	....	....	....	....	....	10,260	....
Portland, Me.	....	....	....	....	4,800	3,750	....	....	....	....	....

## Cubic Yards of Garbage Disposed of by Each Method.

## Cities of More Than 30,000 Population. (Continued.)

City	Dumping on land		Dumping in water		Feeding to swine.		Burial	Reduction		Incineration	
	By city employees	By contractors	By city employees	By contractors	By city employees	By contractors	By city employees	By city employees	By contractors	By city employees	By contractors
Terre Haute .....										21,600	
East St. Louis .....			5,760								
Holyoke .....					5,400	2,806					
Brockton .....										10,300	
Johnstown .....										5,958	
Jacksonville .....	72,324										
Oklahoma City .....	3,968										
Bayonne .....	5,928										
Covington .....							1,304			5,160	
South Bend .....					992					10,527	
Allentown .....										8,750	
Pawtucket .....						6,400					
Canton .....										5,360	
Springfield, O. ....		1,728									
Binghamton .....							2,000				7,200
Lancaster .....											
Sioux City .....	7,500										
Atlantic City .....									22,400		
Rockford .....		8,064									
York .....									12,000		
Malden .....					3,302						
Haverhill .....						9,179					
Salem .....					5,251						
New Britain .....						5,616					
Davenport .....			15,657								
McKeesport .....										4,627	
Wheeling .....										10,501	
Newton .....						6,060					
Dubuque .....						2,995					
Butte .....	1,062										
Chester .....						8,013					
Montgomery .....	9,790										
Galveston .....							24,960				
Fitchburg .....						5,440					
Quincy .....				6,576							
New Castle .....											6,453
Auburn .....		4,173									
Taunton .....					1,500						
Everett .....						4,882					
Chelsea .....						3,674					
La Crosse .....			1,620								
Total number of cities.....	14	5	8	2	19	18	6	1	25	30	5
Total amounts .....	233,790	36,065	299,864	41,659	196,200	250,936	157,981	71,344	2,346,692	505,162	30,267

## NEW TYPE OF GARBAGE FURNACE.

Homestead, Pa., October 27, 1913.

Editor Municipal Journal,  
New York City.

Dear Sir:

The garbage system here has been unsatisfactory up until a year ago last May. It was done partly by the city and partly by contract. The present system is only temporary, awaiting the construction of a new style furnace by Munhall Borough. On this account not much attention has been given to regulating the work. It was expected that the new furnace would be ready within sixty days, but many delays have extended the time for over a year and a half. Thus we have been caused unexpected expense in rebuilding our furnace and erecting a new stack, and have been bothered with road repairing and new road building by the county, which blocked us frequently, and with the rains, which made the road impassable at times. Notwithstanding all this, the town has been kept clean as never before. We had a clean-up week in August which almost swamped us. It is estimated that 650 tons of rubbish, ashes and, in fact, everything imaginable was removed. It required two automobile trucks for one week and six teams and one automobile for two more weeks to do the work. I do not have the cost of the work at hand, but can get it later if desired. At present we are burning garbage for Munhall Borough and for West Homestead Borough (both adjoining boroughs) along with our own. I know of no other borough or city in this state where an automobile truck is made use of for garbage collection, and a year ago I could learn of but half a dozen in the United States. We should have two trucks here to do the work right, and we could then take care of all the street hauling with the same equipment. When we make use of the new Munhall furnace, our system of collecting and hauling may be greatly changed, as we then expect to have a very short haul.

I do not know whether or not you have any information concerning the new Munhall Borough furnace. At any rate, I shall try to give you a few main facts, as I think it will be of decided interest to every town in the state and elsewhere, for that matter. Munhall is the borough in which the principal works of the Carnegie Steel Co. are located, and the company seems to supervise the borough affairs. The new furnace is located about six miles back from the river in Mifflin township, alongside the Union railroad (which belongs to the United States Steel Corporation). The idea of the furnace was suggested by the furnace in use at the Universal cement plant belonging to the United States Steel Corporation, located at Unity on

the Bessemer railroad, about six miles from here. A sort of a test was made in that furnace which proved to be wonderfully successful. The new Munhall furnace consists of a steel tube, six feet in diameter, 90 feet long, lined with firebrick. It is inclined horizontally, close to the ground, and is rotated by mechanism, and a blast sent through the tube which consumes everything that goes into it, throwing the ashes out at the further end automatically. It is costing \$25,000. It has been designed and built by the steel works. Its capacity will take care of everything from Homestead, West Homestead, Munhall, Duquesne and Braddock, and probably much more, if expectations are realized. The cost of operation is calculated to be a minimum for that kind of work. Of course, I know nothing about the actual cost of operation or capacity. It strikes me, however, as being original and unique, a new departure in furnace construction for garbage and rubbish disposal.

Yours truly,  
M. P. SCHOOLEY.

## ATLANTA'S REFUSE DESTRUCTOR.

We are informed by John Jentzen, Chief of the Sanitary Department of Atlanta, Ga., that the plant which has been constructed for that city by the Destructor Company is being operated by the company under a contract by which the city pays 25 cents for each ton of garbage destroyed. The acceptance of the plant by the city is, we understand, to be based upon its satisfactory performance while operated by the Destructor Company under this contract.

## NINETY MILLIONS OF MUNICIPALS.

According to our Bond Election table (not reproduced here), the voters of about fifty municipalities throughout the United States will vote November 4 on propositions to issue bonds, the aggregate of which is above \$90,000,000. This huge sum, if voted, will be used to construct schools, courthouses, jails, water works, lighting systems, armories, police and fire houses, parks, roads, sewers, bridges and to care for all kinds of municipal properties and enterprises.

The largest single election is that of the state of Pennsylvania, where there is involved \$50,000,000 for highways.—*The Bond Buyer.*



GARBAGE COLLECTION IN AMERICAN CITIES. TABLE NO. I.

City.	Population col- lected from.	Average daily quantity of refuse.						Collected by city or contract?
		Garbage		Ashes		Rubbish		
		Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	
<b>Alabama:</b>								
Gadsden .....	.....	.....	.....	.....	.....	1 load	.....	.....
<b>California:</b>								
San Francisco .....	455,000	.....	.....	.....	.....	.....	.....	.....
<b>Colorado:</b>								
Denver .....	200,000	80 T.	60 T.	500 T. a	700 T. a	.....	.....	contract
Pueblo .....	50,000	.....	.....	.....	.....	.....	.....	contract
<b>Connecticut:</b>								
Bridgeport .....	110,000	53 T.	40 T.	.....	.....	.....	.....	contract
Hartford .....	60,000	.....	.....	350 cu. yds. a	.....	.....	.....	city
New Britain .....	50,000	.....	.....	.....	.....	.....	.....	private; some garbage by contract
New Haven .....	130,000	.....	.....	.....	.....	.....	.....	1/2 city; 2/3 con- tract
<b>District of Columbia:</b>								
Washington .....	340,000	150 T	140 T.	292 T.	570 T.	33 T.	25 T.	contract
<b>Illinois:</b>								
Evanston .....	30,000	15 T.	13.5 T.	19 cu. yds.	86 cu. yds	169 cu. yds.	122.5 cu. yds.	city
Oak Park .....	25,000	.....	.....	.....	.....	.....	.....	village
Springfield .....	57,000	.....	.....	.....	.....	.....	.....	private parties
<b>Indiana:</b>								
Fort Wayne .....	70,000	24.66 T.	12.33 T.	.....	.....	.....	.....	city, hired t'ms
Logansport .....	20,000	.....	.....	.....	.....	.....	.....	contract
Richmond .....	25,000	20 cu. yds.	18 cu. yds.	.....	.....	.....	.....	city
<b>Iowa:</b>								
Cedar Rapids .....	35,000	24 cu. yds.	16 cu. yds.	.....	.....	.....	.....	city
<b>Maine:</b>								
Lewiston .....	73,000	.....	.....	.....	.....	.....	.....	city
<b>Massachusetts:</b>								
Cambridge .....	105,000	35 T.	40 T.	10 T.	60 T.	2 T.	3 T.	city
Lawrence .....	88,000	10 loads f	.....	134 loads a f	.....	.....	.....	city
New Bedford .....	100,000	30 T.	25 T.	270 cu. yds. a	.....	.....	.....	contract j
Westfield .....	13,000	13 1/2 cu. yds.	10 cu. yds.	.....	.....	.....	.....	contract
<b>Michigan:</b>								
Ann Arbor .....	20,000	8 T.	7 T.	.....	.....	.....	.....	contract
Kalamazoo .....	45,000	10 T.	5 T.	.....	.....	.....	.....	private parties
<b>Minnesota:</b>								
Mankato .....	12,000	4 cu. yds.	.....	.....	.....	.....	.....	city
St. Cloud .....	.....	3/4 T.	1/2 T.	.....	.....	.....	.....	contract
<b>Mississippi:</b>								
Vicksburg .....	10,000	.....	.....	.....	.....	.....	.....	city
<b>Missouri:</b>								
Kansas City .....	275,000	.....	.....	.....	.....	.....	.....	contract
<b>New Jersey:</b>								
Elizabeth .....	81,149	98 T. d	146 T. d	.....	.....	.....	.....	contract
Trenton .....	98,000	50 T.	32 1/2 T.	83 T.	163 1/2 T.	e	e	city
<b>New York City:</b>								
Borough of Bronx....	533,000	116.6 loads	100.0 loads	237.1 loads	397.3 loads	65.9 loads	55.6 loads	city
Borough of Brooklyn..	1,775,000	364.1 loads	382.2 loads	1,607.9 loads	2,470.7 loads	468.8 loads	416.1 loads	city
Borough Manhattan...	2,440,000	597.4 loads	457.5 loads	4,143.1 loads	5,961.3 loads	679.0 loads	611.2 loads	city
<b>New York State:</b>								
Hudson .....	12,000	.....	.....	24 T.	36 T.	5 T.	5 T.	contract
Rochester .....	.....	100 T.	87 T.	365 T.	768 T.	28 T.	27 T.	contract j
Watertown .....	28,000	.....	.....	.....	.....	30 cu. yds.	.....	contract
<b>North Carolina:</b>								
Asheville .....	25,000	6 T.	6 T.	5 T.	10 T.	28 cu. yds.	28 cu. yds.	city
<b>Ohio:</b>								
Columbus .....	200,000	75 T.	55 T.	270 cu. yds. a	304 cu. yds. a	.....	.....	city
Cleveland .....	650,000	235 T.	125 T.	998 cu. yds. a f	.....	.....	.....	city
Lima .....	35,000	4 cu. yds.	.....	.....	.....	.....	.....	contract
Lorain .....	30,000	.....	.....	.....	.....	.....	.....	contract
Youngstown .....	100,000	.....	.....	.....	.....	.....	.....	contract
<b>Pennsylvania:</b>								
Homestead .....	20,000	.....	.....	.....	.....	.....	.....	city
Butler .....	22,000	6 T.	3 T.	1 T.	1/2 T.	1/2 T.	1/4 T.	contract
Chester .....	40,000	18 T.	10 T.	76 T. a	152 T. a	.....	.....	contract
Oil City .....	.....	16 T. d	10 T. d	.....	.....	.....	.....	private parties
McKees Rocks.....	15,000	3 3/4 T.	2 T.	none	none	none	none	contract
Meadville .....	13,000	14 T. d	12 T. d	.....	.....	.....	.....	contract
<b>Rhode Island:</b>								
Providence .....	240,000	54.8 T. f	.....	.....	.....	.....	.....	contract
<b>South Carolina:</b>								
Charleston .....	65,000	47.4 loads d	46.1 loads d	.....	.....	.....	.....	city
Columbia .....	40,000	72 cu. yds. d f	.....	.....	.....	.....	.....	city

For footnotes see page 632.

Garbage Collection in American Cities. Table No. I. (Continued.)

City.	Population col- lected from.	Average daily quantity of refuse.						Collected by city or contract?
		Garbage		Ashes		Rubbish		
		Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	
<b>Tennessee:</b>								
Jackson .....	20,000	....	....	....	....	....	....	city
<b>Utah:</b>								
Salt Lake City.....	100,000	4.5 cu.yds. d	4.5 cu. yds. d	....	....	....	....	city
<b>Virginia:</b>								
Danville .....	20,000	16¼ T.	12½ T.	....	....	....	....	city
Newport News.....	25,000	....	....	....	....	....	....	city
<b>Wisconsin:</b>								
La Crosse .....	31,000	12 cu. yds.	none	....	....	....	....	city
<b>West Virginia:</b>								
Wheeling .....	41,641	27 T.	20 T.	....	....	....	....	city
<b>Wyoming:</b>								
Cheyenne .....	15,000	33 cu. yds.	27 cu. yds.	24 cu. yds. a	36 cu. yds. a	....	....	contract
<b>Washington:</b>								
Walla Walla .....	20,000	....	....	....	....	....	....	contract

GARBAGE COLLECTION. TABLE NO. II.

City.	Size and type.	House cans Taken from and left by collector.	Is garbage required to be drained or wrapper in paper?	Average length of haul, miles.		
				Garbage.	Ashes.	Rubbish.
<b>California:</b>						
San Francisco .....	.....	.....	.....	.....	.....	2, lt. grade.
<b>Colorado:</b>						
Denver .....	Any light covered.	Alley.	No; paper prohibited.	3	1-3	1-3
Pueblo .....	Two to five gallons.	Rear of lot near alley.	No.	1-2	.....	.....
<b>Connecticut:</b>						
Bridgeport .....	Covered metal not larger than half bbl.	Yard.	No.	1 1/2, level	.....	.....
Hartford .....	.....	Yard.	No.	1.3	0.9	.....
New Britain.....	Covered galv. can.	Backyard.	Drained.	2	3/4	3/4
New Haven.....	No requirement.	No requirement.	No.	Abt. 2.8	.....	.....
<b>District of Columbia:</b>						
Washington .....	Garbage, 3-10 gals. covered; ashes, 10-24 gals.; refuse, 1-man receptacles.	Alley gate or front areaway.	Drained, not wrapped.	2 1/2, level	3, level	2, level
<b>Illinois:</b>						
Evanston .....	6-15 gal. galv., covered	Inside alley gate.	No.	1.1 level	0.5 level	0.5 level
Oak Park.....	30-gal.	Alley gate or curb.	No, but many do.	1, level	1, level	3 1/2, level
Springfield .....	Covered metal can.	Not specified.	No.	Max. 1 1/2	.....	.....
<b>Indiana:</b>						
Fort Wayne.....	Enclosed metal.	Alley or convenient pl.	Asked, not required.	1 1/2, level	.....	.....
Logansport .....	5 gal.	Alley gate.	No.	3	1	3
Richmond .....	Covered.	Near alley.	No.	1, 1-4%	.....	.....
<b>Iowa:</b>						
Cedar Rapids.....	Galv. 5-30 gals.	Near alley as possible.	Drained.	1 1/2	.....	.....
<b>Maine:</b>						
Lewiston .....	.....	Edge of walk.	No.	.....	1/2	.....
<b>Massachusetts:</b>						
Cambridge .....	No larger than flour bbl.	Rear of house b	Drained.	1 1/2	3/4	3/4
Lawrence .....	Galv.	Cellar or rear of bldg.	No.	1	1 1/2	1 1/2
New Bedford.....	Not too heavy for 2 men.	Garbage, yard; ashes, curb.	No.	4	1/2	.....
Westfield .....	Metal, more than 5 gals.	Back door.	Drained.	2, 2% grade	.....	.....
<b>Michigan:</b>						
Ann Arbor .....	Covered, 2 to 20 gals.	House.	Drained.	3	1	1
Kalamazoo .....	10 gal.	Rear of Yard.	Asked, not required.	3	1	1
<b>Minnesota:</b>						
Mankato .....	Galv., covered, not less than 10 gals.	Alley.	No.	1 1/4	.....	.....
St. Cloud.....	.....	Alley.	No.	2	1	1
<b>Mississippi:</b>						
Vicksburg .....	18" x 2 1/2'	Front of house.	No.	1 1/2	1 1/2	1 1/2
<b>Missouri:</b>						
Kansas City.....	Galv. 3-15 gals.	Rear of premises.	No.	6	5	5
<b>New Jersey:</b>						
Elizabeth .....	Metal, covered, 1 man can lift.	Curb.	No.	3/4	.....	.....
Trenton .....	Not over 75 lbs.	Curb or alley.	Drained & wrapped.	1 3/4, level	3/4, level	.....
<b>New York State:</b>						
Hudson .....	28" high, 15" diam.	Rear of residence.	No.	1/2, level	1/2, level	.....
Rochester .....	Not too large for 2 men.	Rear of house.	No.	2, lt. grades	1 1/2	2
Watertown .....	.....	Rear of house.	No.	2	.....	2
<b>North Carolina:</b>						
Asheville .....	10 gal.	Front.	No.	3 1/2	3 1/2	3 1/2

For footnotes see page 632.



Garbage Collection. Table No. II. (Continued.)

City.	Size and type.	House cans Taken from and left by collector.	Is garbage required to be drained or wrapped in paper?	Average length of haul, miles.		
				Garbage.	Ashes.	Rubbish.
<b>Ohio:</b>						
Columbus .....	Tight galv. with lid, 2 bush. c	Within lot line, near alley, if possible.	No.	4	2	2
Cleveland .....	Garbage, 10 gal.; rub- bish, 30 gal.	Rear of house.	No.	2½	1½, 1½ % a	.....
Lima .....	Covered, 3-5 gals.	Front curb.	Drained.	3 flat	.....	.....
Lorain .....	.....	Rear of property.	Drained.	.....	.....	.....
Youngstown .....	.....	Back door.	Drained only.	.....	.....	.....
<b>Pennsylvania:</b>						
Homestead .....	Any.	Any place.	No.	1¼, steep. a	.....	.....
Butler .....	1-2 bushels.	House.	No.	2, 6%	2, 6%	.....
Chester .....	75 lb.	Curb or alley.	No.	16 blocks	6 blocks	.....
Oil City .....	.....	Rear of house.	No.	2, level	.....	.....
McKees Rocks.....	Not more than 2 bush.	Rear of house.	No.	5	.....	.....
Meadville .....	Galv., covered.	Rear of house.	No, but requested.	2, aver. 3%	.....	.....
<b>Rhode Island:</b>						
Providence .....	Watertight, covered.	Yard.	No.	1¼-1½	.....	.....
<b>South Carolina:</b>						
Charleston .....	Metal, tight, covered, 1.9 cu. ft.	Edge of walk.	No.	.....	.....	.....
Columbia .....	Not specified.	Rear of house.	No.	1-2	.....	.....
<b>Tennessee:</b>						
Jackson .....	18" x 30"	Sidewalk.	No.	.....	.....	.....
<b>Utah:</b>						
Salt Lake City....	Covered, handles, max. weight full 100 lbs.	Curb.	No.	4, 5% grade	.....	.....
<b>Virginia:</b>						
Danville .....	.....	Backyard.	No.	0.8, average 4% down	.....	.....
Newport News....	Covered.	Backyard.	No.	.....	1	.....
<b>Wisconsin:</b>						
La Crosse .....	.....	Yard.	Drained.	1	.....	.....
<b>West Virginia:</b>						
Wheeling .....	Galv., covered, 20 gal.	Backyard.	Yes, both.	2, very steep	.....	.....
<b>Wyoming:</b>						
Cheyenne .....	.....	Alley or property line.	No.	1½	.....	.....
<b>Washington:</b>						
Walla Walla.....	Covered.	Alley.	No.	2½	1½	1½

GARBAGE COLLECTION. TABLE NO. III.

	Number of Wagons Used						Number of Men Employed					
	Garbage		Ashes		Rubbish		Garbage		Ashes		Rubbish	
	Summer.	Winter.	Summer.	Winter.	Sum'er.	Winter.	Sum'er.	Winter.	Sum'er.	Winter.	Sum'er.	Winter.
<b>Colorado:</b>												
Denver .....	..	..	375a	..	..	..	..	..	..	..	..	..
<b>Connecticut:</b>												
Bridgeport .....	14	9	..	..	..	..	28	18	..	..	..	..
Hartford .....	6	..	11ag	..	..	..	7	..	31ag	..	..	..
New Haven .....	20	20	..	..	..	..	40	40	..	..	..	..
<b>District of Columbia:</b>												
Washington .....	85	65	30	75	30	30	110	85	60	150	30	30
<b>Illinois:</b>												
Evanston .....	8	..	12a	..	..	..	8	..	12a	..	..	..
Oak Park .....	4	4	1	4	1	1	6	6	2	6	2	2
<b>Indiana:</b>												
Fort Wayne .....	9	8	..	..	..	..	..	..	..	..	..	..
Logansport .....	4	3	1	1	1	1	5	4	1	1	1	1
Richmond .....	..	..	10a	12a	..	..	..	..	15a	18a	..	..
<b>Iowa:</b>												
Cedar Rapids .....	6	4	..	..	..	..	..	..	..	..	..	..
<b>Massachusetts:</b>												
Cambridge .....	22	22	12	18	4	4	47	47	20	35	5	5
Lawrence .....	5	5	19a	19a	..	..	10	10	75a	75a	..	..
New Bedford .....	14	19	10a	14a	..	..	30	25	30a	42a	..	..
<b>Michigan:</b>												
Ann Arbor .....	4	4	..	..	..	..	6	6	..	..	..	..
Kalamazoo .....	8	8	..	..	..	..	15	8	..	..	..	..
<b>Minnesota:</b>												
Mankato .....	1	None	..	..	..	..	2	..	..	..	..	..
St. Cloud .....	1	0	..	..	..	..	1	0	..	..	..	..
<b>Missouri:</b>												
Kansas City .....	40	..	..	..	..	..	45	..	..	..	..	..
<b>New Jersey:</b>												
Elizabeth .....	7d	10d	..	..	..	..	15d	21d	..	..	..	..
Trenton .....	9	6	4	9	..	..	9	6	4	9	..	..
<b>New York State:</b>												
Hudson .....	2	3	5	5	2	2	2	2	5	8	2	2
Rochester .....	34	..	30	70	12	12	34	..	50	120	25	25
Watertown .....	3	..	..	..	2	..	3	..	..	..	4	..

For footnotes see page 632.

Garbage Collection. Table No. III. (Continued.)

	Number of Wagons Used						Number of Men Employed					
	Garbage		Ashes		Rubbish		Garbage		Ashes		Rubbish	
	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.
<b>New York City:</b>												
Bronx Borough .....	..	..	..	..	..	..	119d	..	..	..	..	..
Brooklyn Borough .....	..	..	..	..	..	..	451d	..	..	..	..	..
Manhattan Borough .....	..	..	..	..	..	..	792d	..	..	..	..	..
<b>North Carolina:</b>												
Asheville .....	1	..	2	..	5	..	2	..	2	..	12	..
<b>Ohio:</b>												
Cleveland .....	100	100	84a	98a	..	..	120	120	160a	200a	..	..
Columbus .....	29	20	32a	43a	..	..	31	22	33a	45a	..	..
Lima .....	2	0	..	..	..	..	2	0	..	..	..	..
<b>Pennsylvania:</b>												
Butler .....	2	2	2	2	2	2	3	3	3	3	3	3
Chester .....	2	2	2a	4a	..	..	6	3	4a	8a	..	..
Homestead .....	1dk	1d	..	..	..	..	6d	6d	..	..	..	..
McKees Rocks .....	2	2	..	..	..	..	4	4	..	..	..	..
Meadville .....	3a	2a	..	..	..	..	6a	4a	..	..	..	..
<b>Rhode Island:</b>												
Providence .....	24	22	..	..	..	..	45	44	..	..	..	..
<b>Tennessee:</b>												
Jackson .....	2d	2d	..	..	..	..	4d	4d	..	..	..	..
<b>Utah:</b>												
Salt Lake City .....	15	15	..	..	..	..	15	15	..	..	..	..
<b>Virginia:</b>												
Danville .....	11a	11a	..	..	..	..	12a	12a	..	..	..	..
Newport News .....	11	11	..	..	..	..	11	11	..	..	..	..
<b>Wisconsin:</b>												
La Crosse .....	4	None	..	..	..	..	4	None	..	..	..	..
<b>Washington:</b>												
Walla Walla .....	2	2	3a	5a	..	..	2	2	6a	10a	..	..
<b>West Virginia:</b>												
Wheeling .....	8	6	..	..	..	..	16	12	..	..	..	..
<b>Wyoming:</b>												
Cheyenne .....	1	1	4a	4a	..	..	1	1	4a	4a	..	..

GARBAGE COLLECTION. TABLE NO. IV.

City.	Number of Collections per Week.												Cost of Collection.*		
	Garbage			Ashes			Rubbish						Garbage		
	Summer	Winter		Summer	Winter		Summer	Winter		Summer	Winter		Garbage	Ashes	Rubbish
	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying
<b>Colorado:</b>															
Denver .....	6	3	..	..	..	..	..	..	..	..	..	..	..	..	..
Pueblo .....	6	3	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Connecticut:</b>															
Bridgeport .....	6	3	2	6	2	1	..	..	..	..	..	..	\$2.32	..	..
Hartford .....	6	3	2	6	2	1	..	..	..	..	..	..	..	..	..
New Britain .....	3	3	2	3	2	1	..	..	..	..	..	..	3,000	..	..
New Haven .....	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>District of Columbia:</b>															
Washington .....	6	6	3	6	3	1	..	1	1	..	2	1	..	1	1
<b>Illinois:</b>															
Evanston .....	3	3-4	3	3	3	3	2-3	2-3	3	1-2	1-2	1	2-3	2-3	3
Oak Park .....	1½	1½	1½	1½	1½	1½	..	..	..	1	1	1	..	..	1
Springfield .....	6	3	..	6	1-2	..	..	..	..	..	..	..	..	..	..
<b>Indiana:</b>															
Fort Wayne .....	..	2	2	..	1	1	..	..	..	..	..	..	..	1.90h	..
Logansport .....	6	4	4	4	3	3	6	..	..	4	..	..	6	..	..
Richmond .....	..	..	..	..	..	2a	1a	..	2a	1a	..	..	..	..	..
<b>Iowa:</b>															
Cedar Rapids .....	2	2	1	1	1	1	..	..	..	..	..	..	..	..	..
<b>Maine:</b>															
Lewiston .....	..	..	..	..	..	2	2	2	2	2	2	2	2	2	2
<b>Massachusetts:</b>															
Cambridge .....	3	12	12	3	12	12	1	1	1	1	1	1	1	1	1
Lawrence .....	2	1	1	2	1	1	2	2	1	2	2	1	2	2	1
New Bedford .....	6	3	3	6	3	3	1a	1a	none	1a	1a	none	..	..	..
Westfield .....	6	3	12	3	12	12	..	..	..	..	..	..	..	..	..
<b>Michigan:</b>															
Ann Arbor .....	4	12	12	4	12	12	..	..	..	..	..	..	..	3,600	..
Kalamazoo .....	6	12	12	6	12	12	..	..	..	..	..	..	..	6.00	1.50
<b>Minnesota:</b>															
Mankato .....	6	6	2	none	none	none	..	..	..	..	..	..	..	1.25	..
St. Cloud .....	6	3	0	4	..	..	..	..	..	..	..	..	..	1.00	..

a—Includes rubbish. b—Can left at gate or just inside property line. c—Rubbish receptacles may be of wood, capacity of a barrel. d—Includes ashes and rubbish. e—Combustible rubbish included with garbage, non-combustible with ashes. f—Average for the year. g—Also 2 for paper. h—Per ton, including disposal. i—Per cubic yard. j—Garbage by contract, ashes by city. k—Automobile truck. \*Per ton, or total annual expenditure.



Garbage Collection. Table No. IV. (Continued.)

City.	Number of Collections per Week.															Cost of Collection.*					
	Garbage						Ashes						Rubbish			Garbage	Ashes	Rubbish			
	Summer			Winter			Summer			Winter			Summer						Winter		
	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying	Business	Residential	Outlying
<b>Mississippi:</b>																					
Vicksburg .....	6	6	1	6	6	1	6	6	1	6	6	1	6	6	1	6	6	1	.....	.....	.....
<b>Missouri:</b>																					
Kansas City...	6	2	1	6	1	1	..	..	..	..	..	..	..	..	..	..	..	..	48.000	.....	.....
<b>New Jersey:</b>																					
Elizabeth .....	6d	2d	2d	6d	2d	2d	..	..	..	..	..	..	..	..	..	..	..	..	0.41	.....	.....
Trenton .....	3	3	3	3	3	3	3	3	3	3	3	3	e	e	e	e	e	e	1.098	0.3425	.....
<b>New York:</b>																					
Hudson .....	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	.....	.34	.34
Rochester .....	6	1	1	6	1	1	6	1½	1½	6	1	1	6	1	1	6	1	1	2.35	0.90	3.00
Watertown ...	2	2	2	..	..	..	..	..	1½	..	..	..	..	..	..	..	..	..	.....	.....	.....
<b>N. Carolina:</b>																					
Asheville .....	none	..	1	..	..	..	12	..	1	..	..	..	12	..	1	..	..	..	4.00	0.50	0.25
<b>Ohio:</b>																					
Cleveland .....	6	2	1	6	2	1	½a	½a	½a	0.7a	0.7a	0.7a	..	..	..	..	..	..	2.50	0.80a	.....
Columbus .....	6	2	1	6	1	1	6	½	½	6	½	½	..	..	..	..	..	..	1.86	.64a	.....
Lima .....	2	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
Lorain .....	1	1	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
Youngstown...	6	2	2	4	1	1	..	..	..	..	..	..	..	..	..	..	..	..	2.90	.....	.....
<b>Pennsylvania:</b>																					
Butler .....	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	2.24d	.....	.....
Chester .....	2	2	..	1	1	..	1a	1a	..	2a	2a	..	..	..	..	..	..	..	3,700	4,200a	.....
Homestead ...	2a	1a	1a	2a	1a	1a	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
Warren .....	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
McKees Rocks..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5,000	.....	.....
Meadville .....	4	2	..	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
<b>Rhode Island:</b>																					
Providence ...	3	3	3	2	2	2	..	..	..	..	..	..	..	..	..	..	..	..	27,590	.....	.....
<b>S. Carolina:</b>																					
Charleston .....	3d	3d	3d	3d	3d	3d	..	..	..	..	..	..	..	..	..	..	..	..	23,551 d	.....	.....
Columbia .....	3d	3d	3d	3d	3d	3d	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
<b>Tennessee:</b>																					
Jackson .....	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4,927	.....	.....
<b>Utah:</b>																					
Salt Lake City..	6	1	1	6	1	1	6	1	1	6	1	1	6	1	1	6	1	1	1.125 d	.....	.....
<b>Virginia:</b>																					
Danville .....	4	2	..	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
Newport News..	2	2	2	2	2	2	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
<b>Wisconsin:</b>																					
La Crosse.....	3	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....	.....	.....
<b>Washington:</b>																					
Walla Walla..	6	2	2	6	2	2	6a	2a	2a	6a	2a	2a	..	..	..	..	..	..	.....	.....	.....
<b>West Virginia:</b>																					
Wheeling .....	6	2	..	6	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2.30	.....	.....
<b>Wyoming:</b>																					
Cheyenne .....	2	1	1	2	1	1	2a	1a	1a	2a	1a	1a	..	..	..	..	..	..	.....	.....	.....

STREET CLEANING IN AMERICAN CITIES.

TABLE NO. I.

City.	Total annual expenditures for street cleaning—				City.	Total annual expenditures for street cleaning—			
	Salaries and wages.	New appliances.	Repairing and maintaining appliances.	Other expenses.		Salaries and wages.	New appliances.	Repairing and maintaining appliances.	Other expenses.
<b>California:</b>					<b>North Carolina:</b>				
San Francisco...	\$183,385	\$3,000	\$13,858	\$129,402	Asheville .....	9,622	1,112	978	5,981
<b>Colorado:</b>					<b>Ohio:</b>				
Trinidad .....	..	..	..	5,340a	Cleveland .....	205,918	13,871	24,163	30,441
<b>District of Columbia:</b>					Elyria .....	4,500	..	300	200
Washington .....	208,983b	37,274	..	59,841c	Lima .....	3,390	..	..	390
<b>Illinois:</b>					Sandusky .....	6,000	600	1,000	400
Alton .....	3,760	450	..	250	<b>Pennsylvania:</b>				
Evanston .....	2,606	300	50	..	Butler .....	2,000	125	..	..
<b>Indiana:</b>					Chester .....	12,292	..	..	..
Logansport .....	7,000	..	..	..	McKees Rocks..	3,500	500	200	100
Richmond .....	2,285	..	..	..	Williamsport ..	10,000	..	250	..
<b>Massachusetts:</b>					<b>Rhode Island:</b>				
Lawrence .....	40,000	..	..	..	Newport .....	29,962e	..	..	..
New Bedford .....	68,111	..	514	..	Pawtucket .....	11,284	..	358	..
Westfield .....	4,380	..	..	..	<b>South Carolina:</b>				
<b>Michigan:</b>					Columbia .....	2,167f	800	..	..
Ann Arbor .....	4,935d	..	55	..	Greenville .....	2,500	850	200	..
<b>Minnesota:</b>					<b>Texas:</b>				
Mankato .....	1,240	..	150	150	Beaumont .....	6,644e	..	..	..
Minneapolis .....	137,093e	..	..	..	Temple .....	7,000	250	200	75
<b>Mississippi:</b>					<b>Virginia:</b>				
Vicksburg .....	2,500	..	..	..	Danville .....	5,633e	..	..	..
<b>Missouri:</b>					Newport News ..	4,850	..	310	..
Kansas City .....	225,000e	..	..	..	<b>Washington:</b>				
<b>Nebraska:</b>					Seattle .....	21,516e	..	..	..
Omaha .....	60,000e	..	..	..	Walla Walla .....	4,500	1,800	..	4,700g
<b>New Jersey:</b>					<b>Wisconsin:</b>				
Long Branch .....	2,500	..	..	..	Eau Claire .....	1,854	..	..	..
Morristown .....	5,781	..	..	..	Green Bay .....	14,017e	..	..	..
Paterson .....	46,500	..	..	..					
Trenton .....	38,655	1,766	500	250					
<b>New York State:</b>									
Ithaca .....	8,469	516	456	2,600					
Ogdensburg .....	3,625	1,300	150	..					
Watertown .....	11,000	1,900	100	100					

A—Contract price. b—Includes stable expenses, supplies and repairs. c—Includes \$50,101 for overhead charges and foremen's salaries. d—Includes \$744 for general spring cleaning. e—Total cost. f—Includes maintenance. g—Includes cleaning catch basins.

## STREET CLEANING IN

City	Miles of streets	Areas subject to cleaning; sq. yds.				Amount of cleaning done per week; sq. yds.			
		Smooth	Rough	Macadam	Total	Smooth	Rough	Macadam	Total
Cleaning by hand sweeping only									
California:									
San Francisco .....	443	714,850b	.....	.....	6,350,700c	4,514,100b	.....	.....	7,000,000c
District of Columbia:									
Washington .....	465.1	2,595,928	217,072	1,481,525	4,555,257	15,575,568	1,302,434	1,481,525	18,620,257
Illinois:									
Canton .....	...	3,600	.....	.....	.....	21,600	.....	.....	.....
Evanston .....	...	300,000	.....	900,000	.....	100,000	.....	300,000	.....
Indiana:									
Logansport .....	50	150,000	.....	.....	.....	150,000	.....	.....	.....
Richmond .....	68	60,000	.....	.....	.....	360,000	.....	.....	.....
Kansas:									
Coffeyville .....	...	20,000	.....	.....	.....	d	.....	.....	.....
Pittsburg .....	16h	.....	32,000	.....	.....	.....	224,000	.....	.....
Massachusetts:									
Lawrence .....	115	326,333	.....	.....	.....	.....	.....	.....	.....
New Bedford .....	176	97,300	102,890	49,660	249,850	.....	.....	.....	.....
Westfield .....	125	44,500	1,970	.....	46,470	.....	.....	.....	278,820
Minnesota:									
St. Cloud .....	70	.....	.....	30,000	.....	.....	.....	180,000	.....
Missouri:									
Kansas City e.....	408h	.....	.....	.....	6,442,500	.....	.....	.....	987,871,500
Nebraska:									
Omaha .....	150h	.....	.....	.....	1,200f	.....	.....	.....	655f
New Jersey:									
Long Branch .....	70	.....	.....	.....	70,000	.....	.....	.....	210,000
Morristown .....	26	56,000	10,000	400,000	.....	56,000	5,000	44,000	.....
Trenton .....	146	435,074	.....	.....	.....	2,610,504	.....	.....	.....
New York:									
Hudson .....	18	30,000	3,000	200,000	233,000	30,000	.....	10,000	40,000
North Carolina:									
Asheville .....	28h	340,000	28,000	78,000	446,000	65,000	.....	.....	.....
Ohio:									
Cleveland .....	499.6	1,837,109	.....	.....	.....	14,600,178	.....	.....	.....
Lima .....	93	.....	.....	.....	26 mi.	.....	.....	.....	.....
Pennsylvania:									
Steelton .....	...	.....	.....	.....	51,800	.....	.....	.....	.....
Williamsport .....	11.7	.....	.....	.....	.....	.....	.....	.....	.....
Rhode Island:									
Newport .....	91.2	.....	.....	.....	.....	.....	.....	.....	971,134
South Carolina:									
Charleston .....	60	.....	.....	.....	.....	.....	.....	.....	.....
Columbia .....	5.6g	202,743	.....	.....	202,743	.....	.....	.....	.....
Texas:									
Temple .....	63	5,675	.....	.....	.....	34,050	.....	.....	.....
Virginia:									
Newport News .....	30	27,000	.....	.....	.....	162,000	.....	.....	.....
Washington:									
Spokane .....	...	206,008	.....	.....	.....	1,228,578	.....	.....	.....
Seattle k .....	178h	.....	.....	.....	.....	45,544	70,456	.....	.....
Cleaning by machine sweeping only									
Alabama:									
Gadsden .....	1h	30,000	.....	.....	.....	180,000	.....	.....	.....
District of Columbia:									
Washington .....	465	1,674,993	550,007	.....	3,065,094	5,024,979	1,650,021	.....	7,515,094
Illinois:									
Alton .....	33h	355,000	.....	.....	.....	48,000	.....	.....	.....
Canton .....	...	528,000	.....	.....	.....	.....	.....	.....	.....
Kansas:									
Coffeyville .....	...	.....	.....	.....	400,000	.....	.....	.....	.....
Michigan:									
Ann Arbor .....	10	56,000	.....	.....	.....	.....	.....	.....	.....
Minnesota:									
Mankato .....	55	40,000	.....	.....	50,000	40,000	.....	.....	.....
New Jersey:									
Trenton .....	50h	450,951	.....	.....	.....	1,800,000	.....	.....	.....
New York:									
Watertown .....	80	.....	.....	230,000	.....	.....	.....	.....	.....
Ohio:									
Lima .....	26g	334,000	.....	.....	.....	668,000	.....	.....	.....
Sandusky .....	85	350,000	.....	.....	.....	350,000	.....	.....	.....
Pennsylvania:									
Carbondale .....	...	.....	.....	.....	.....	90,000	.....	.....	.....
Williamsport .....	11.7	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina:									
Charleston .....	60	.....	.....	.....	.....	.....	.....	.....	.....
Greenville .....	10h	170,000	50,000	.....	220,000	340,000	150,000	.....	490,000
Texas:									
Temple .....	63	55,000	.....	.....	.....	330,000	.....	.....	.....
Vermont:									
Barre .....	...	10,458	9,800	.....	.....	62,740	58,800	.....	.....

Foot footnotes see page 636.



AMERICAN CITIES. TABLE NO. II.

City	Quantity of street sweepings removed per week; cu. yds.				Weeks in the cleaning season				Number of cleanings per week			
	Smooth	Rough	Macadam	Total	Smooth	Rough	Macadam	Total	Smooth	Rough	Macadam	Total
<b>Cleaning by hand sweeping only</b>												
<b>California:</b>												
San Francisco .....	500b	....	....	1,600c	52b	....	....	52c	6 & 7b	....	1c	....
<b>District of Columbia:</b>												
Washington .....	710a	....	218	978	52	52	52	....	6	6	1	....
<b>Illinois:</b>												
Canton .....	....	....	....	....	45	....	....	....	6	....	....	....
Evanston .....	75	....	225	....	32	....	32	....	½	....	½	....
<b>Indiana:</b>												
Logansport .....	....	....	....	....	52	....	....	....	12	....	....	....
Richmond .....	....	....	....	....	48	....	....	....	6	....	....	....
<b>Kansas:</b>												
Coffeyville .....	....	....	....	....	52	....	....	....	....	....	....	....
Pittsburg .....	....	....	....	....	....	52	....	....	....	7	....	....
<b>Massachusetts:</b>												
Lawrence .....	72	....	....	....	30	....	....	....	6	....	....	....
New Bedford .....	....	....	....	....	....	....	....	....	....	....	....	....
Westfield .....	....	....	....	....	....	....	....	....	....	....	....	6
<b>Minnesota:</b>												
St. Cloud .....	....	....	....	....	....	24	....	....	....	....	6	....
<b>Missouri:</b>												
Kansas City e .....	....	....	....	113,500	....	....	....	52	....	....	....	e
<b>Nebraska:</b>												
Omaha .....	....	....	....	200	....	....	....	45	....	....	....	½
<b>New Jersey:</b>												
Long Branch .....	....	....	....	....	....	....	....	52	....	....	....	3
Morristown .....	21	....	54	....	40	36	36	....	7	....	....	....
Trenton .....	....	....	....	....	38	....	....	....	6	....	....	....
<b>New York:</b>												
Hudson .....	....	....	....	....	38	....	....	....	6	½	1/9	....
<b>North Carolina:</b>												
Asheville .....	....	....	....	....	36	....	....	....	....	....	....	....
<b>Ohio:</b>												
Cleveland .....	2,527	....	....	....	35	....	....	....	10	....	....	....
Lima .....	....	....	....	....	....	....	....	30	....	....	....	6
<b>Pennsylvania:</b>												
Steelton .....	....	....	....	....	....	....	....	....	....	....	....	....
Williamsport .....	12	6	....	....	35	35	....	....	6	2	....	....
<b>Rhode Island:</b>												
Newport .....	....	....	....	137	....	....	....	52	....	....	....	....
<b>South Carolina:</b>												
Charleston .....	....	....	....	60	....	....	....	52	....	....	....	....
Columbia .....	....	....	....	....	52	....	....	....	1 & 6	....	....	....
<b>Texas:</b>												
Temple .....	....	....	....	....	40	....	....	....	6	....	....	....
<b>Virginia:</b>												
Newport News ..	....	....	....	....	52	....	....	....	6	....	....	....
<b>Washington:</b>												
Spokane .....	....	....	....	....	52	....	....	....	6	....	....	....
Seattle k .....	89	96	....	....	....	....	....	....	....	....	....	....
<b>Cleaning by machine sweeping only</b>												
<b>Alabama:</b>												
Gadsden .....	12	....	....	....	52	....	....	....	6	....	....	....
<b>District of Columbia:</b>												
Washington .....	563a	....	....	662	52	52	....	52	3	3	....	....
<b>Illinois:</b>												
Alton .....	50	....	....	....	36	....	....	....	1	....	....	....
Canton .....	....	....	....	....	....	....	....	....	1/17	....	....	....
<b>Kansas:</b>												
Coffeyville .....	....	....	....	....	....	....	....	....	....	....	....	....
<b>Michigan:</b>												
Ann Arbor .....	....	....	....	....	32	....	....	....	1	....	....	....
<b>Minnesota:</b>												
Mankato .....	....	....	....	....	24	....	....	....	1	....	....	....
<b>New Jersey:</b>												
Trenton .....	....	....	....	....	38	....	....	....	4	....	....	....
<b>New York:</b>												
Watertown .....	....	....	....	....	....	....	....	....	....	....	....	....
<b>Ohio:</b>												
Lima .....	....	....	....	....	....	....	....	....	2	....	....	....
Sandusky .....	....	....	....	....	25	....	....	....	1	....	....	....
<b>Pennsylvania:</b>												
Carbondale .....	....	....	....	....	32	....	....	....	2	....	....	....
Williamsport .....	150	12	....	....	35	35	....	....	5	2	....	....
<b>South Carolina:</b>												
Charleston .....	....	....	....	140	....	....	....	52	....	....	....	3 & 6
Greenville .....	....	....	....	40	....	....	....	12	2	3	....	....
<b>Texas:</b>												
Temple .....	....	....	....	....	40	....	....	....	6	....	....	....
<b>Vermont:</b>												
Barre .....	....	....	....	....	32	32	....	....	6	6	....	....

## Street Cleaning in

City	Miles of streets	Areas subject to cleaning; sq. yds.				Amount of cleaning done per week; sq. yds.				
		Smooth	Rough	Macadam	Total	Smooth	Rough	Macadam	Total	
Cleaning by machine sweeping only										
Virginia:										
Newport News .....	30	140,000	.....	.....	.....	280,000	.....	.....	.....	
Washington:										
Seattle .....	178h	.....	.....	.....	.....	373,294	225,957	.....	.....	
Spokane .....	...	1,489,721	1,938,185	.....	.....	.....	.....	.....	.....	
Wisconsin:										
Eau Claire .....	...	.....	.....	.....	.....	195,000	.....	.....	.....	
Cleaning by flushing only										
California:										
San Francisco .....	...	100,000	.....	.....	.....	90,000	.....	.....	.....	
District of Columbia:										
Washington .....	...	.....	310,000	.....	310,000	.....	620,000	.....	620,000	
Minnesota:										
Mankato .....	55	85,000	.....	.....	85,000	150,000	.....	.....	150,000	
Nebraska:										
Omaha .....	150h	855f	.....	.....	.....	.....	.....	.....	.....	
North Carolina:										
Asheville .....	28h	.....	.....	.....	.....	340,000	.....	.....	.....	
Ohio:										
Cleveland .....	499.6h	7,001,280	.....	.....	.....	2,223,402	.....	.....	.....	
Lima .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Sandusky .....	...	8,000	.....	.....	.....	16,000	.....	.....	.....	
South Carolina:										
Greenville .....	10h	170,000	50,000	.....	220,000	.....	.....	.....	.....	
Washington:										
Seattle .....	178h	.....	.....	.....	.....	3,983,411	.....	.....	.....	
Spokane .....	...	806,129	.....	.....	.....	2,932,570	.....	.....	.....	
Walla Walla .....	...	240,000	.....	.....	.....	780,000	.....	.....	.....	
Cleaning by both hand and machine sweeping										
Arkansas:										
Fort Smith .....	185	.....	.....	.....	.....	.....	.....	.....	297,500	
California:										
San Francisco .....	...	.....	899,000	.....	.....	.....	1,050,000	.....	.....	
Illinois:										
Canton .....	.....	562,550	.....	.....	.....	.....	.....	.....	.....	
Evanston .....	65	58,670	.....	.....	.....	58,670	.....	.....	.....	
Michigan:										
Ann Arbor .....	10	105,200	.....	.....	.....	804,700	.....	.....	.....	
New Jersey:										
Paterson .....	167	102 mi.	.....	.....	.....	.....	.....	.....	.....	
New York:										
Watertown .....	80	115,000	6,000	.....	.....	.....	.....	.....	.....	
Pennsylvania:										
Butler .....	35h	554,400	.....	.....	.....	102,666	.....	.....	.....	
Texas:										
Temple .....	63	60,675	.....	.....	.....	364,050	.....	.....	.....	
Virginia:										
Danville .....	47.2	123,985	137,876	.....	261,861	173,579	193,026	.....	366,605	
Cleaning by both sweeping and flushing										
Ohio:										
Cleveland .....	499.6	7,001,280	.....	.....	.....	21,099,696	.....	.....	.....	
Elyria .....	20.6	204,160	88,000	58,700	350,860	.....	.....	.....	.....	
Pennsylvania:										
Chester .....	...	600,689	48,000	.....	.....	200,229	16,000	.....	.....	
Oil City .....	.....	.....	.....	.....	274,500	.....	.....	.....	.....	
McKees Rocks .....	17	150,000	10,000	.....	.....	10,000	5,000	.....	.....	
South Carolina:										
Columbia .....	5.6g	202,743	.....	.....	202,743	350,000	.....	.....	350,000	

a—Includes rough pavement also. b—All men stationed on blocks. c—By gangs under acting foreman. d—Irrregular. e—Hand brooms in use all the time, pneumatic flushers and rotary sweepers from April 15th to November 15th. Business districts cleaned one to eight times daily; residence districts from one to three times weekly. f—Blocks. g—Cleaned. h—Paved.



American Cities. Table No. II. (Continued.)

City	Quantity of street sweepings removed per week; cu. yds.				Weeks in the cleaning season				Number of cleanings per week			
	Smooth	Rough	Macadam	Total	Smooth	Rough	Macadam	Total	Smooth	Rough	Macadam	Total
<b>Cleaning by machine sweeping only</b>												
<b>Virginia:</b>												
Newport News .....					52				2			
<b>Washington:</b>												
Seattle .....	178	175			27				4			
Spokane .....												
<b>Wisconsin:</b>												
Eau Claire .....					30				6			
<b>Cleaning by flushing only</b>												
<b>California:</b>												
San Francisco .....	5				52				1			
<b>District of Columbia:</b>												
Washington .....		1			52				2			
<b>Minnesota:</b>												
Mankato .....					30				1-3			
<b>Nebraska:</b>												
Omaha .....					30				¾			
<b>North Carolina:</b>												
Asheville .....									1 & 3			
<b>Ohio:</b>												
Cleveland .....	none				35				1			
Lima .....					22				2			
Sandusky .....	5								2			
<b>South Carolina:</b>												
Greenville .....				30				40	2	3		
<b>Washington:</b>												
Seattle .....	128											
Spokane .....					24				3.6			
Walla Walla .....					50				6 & 2			
<b>Cleaning by both hand and machine sweeping</b>												
<b>Arkansas:</b>												
Fort Smith .....				300j				52				1 & 6
<b>California:</b>												
San Francisco .....		250				52			1 & 2			
<b>Illinois:</b>												
Canton .....					32				1			
Evanston .....	24											
<b>Michigan:</b>												
Ann Arbor .....					32				61			
<b>New Jersey:</b>												
Paterson .....	606				38				7			
<b>New York:</b>												
Watertown .....	30				31				6			
<b>Pennsylvania:</b>												
Butler .....	50				54				2			
<b>Texas:</b>												
Temple .....					40				6			
<b>Virginia:</b>												
Danville .....	50	70		120	52	52		52	1.4	1.4		1.
<b>Cleaning by both sweeping and flushing</b>												
<b>Ohio:</b>												
Cleveland .....	4,830				35				11			
Elyria .....					52				6 & 1			
<b>Pennsylvania:</b>												
Chester .....					40	40			2	1		
Oil City .....												
McKees Rocks .....									¾			
<b>South Carolina:</b>												
Columbia .....					52				1 & 6			

i—Collected by hand patrol, included under hand sweeping. j—Loads. k—For first six months of 1913. l—6 by hand; 65 per cent. twice by machine. 35 per cent. once by machine.

## STREET CLEANING

City	Sq. yds. cleaned per week	Hand Sweeping					Machine sweeping					
		Fore- men and inspect- ors	Me- chanics and other skilled laborers	Teams	Un- skilled laborers	All others	Sq. yds. cleaned and in- spectors	Fore- men and other skilled laborers	Teams	Unskilled laborers	All others	
<b>Alabama:</b>												
Gadsden .....							180,000			1	2	
<b>Arkansas:</b>												
Fort Smith .....	297,500	1			5		297,500			2		
<b>California:</b>												
San Francisco ...	4,514,100a	18	1	37	122		1,050,000	2	1	8	10	
<b>Dist. of Columbia:</b>												
Washington ....	18,640,257	8	5	25	242		7,515,094	6	10	44	30	10
<b>Illinois:</b>												
Alton .....							48,000			1	2	
Canton .....	21,600			1	8		30,500			2	8	
Evanston .....	400,000	2	0	4	8		58,670	1	1			
<b>Indiana:</b>												
Logansport .....	150,000	1		1	10							
Richmond .....	360,000	1		1	6							
<b>Massachusetts:</b>												
Lawrence .....	326,333	1		3	48							
New Bedford ....	249,850	1		6	69							
<b>Michigan:</b>												
Ann Arbor .....	631,200			2	7		229,500			1		
<b>Minnesota:</b>												
Mankato .....							40,000	1	1	1	3	
Minneapolis .....		10		5	87			7		25	40	
St. Cloud .....	1,800,000		3									
<b>Mississippi:</b>												
Vicksburg .....		1	7	2	7			1	2	2	2	
<b>Missouri:</b>												
Kansas City ....												
<b>Nebraska:</b>												
Omaha .....	665c	2		4	75							
<b>New Jersey:</b>												
Long Branch ...	210,000				5							
Paterson .....	80 mi.	3		6	62							
Trenton .....	2,610,504		56	4			1,800,000		16	10		
<b>New York:</b>												
Hudson .....	180,000	1		3	10							
Ogdensburg .....		1		1	2			1		1	1	
Schenectady .....		2	60									
Watertown .....	696,000	1		2	21		696,000	1		2	4	
<b>North Carolina:</b>												
Asheville .....		3		3								
<b>Ohio:</b>												
Cleveland .....	14,600,178	25		36	392							
Elyria .....	400,000	1		2	11							
Lima .....	654,000			1	9		668,000			5		
Sandusky .....							350,000			3	5	2
<b>Pennsylvania:</b>												
Butler .....		1			2			1		2	4	
Chester .....		1			12					7	3	
Farrell .....	70,000	1		1	8		70,000	1		2	6	
McKees Rocks ..		1		1	3							
Warren .....								4		1	4	
Williamsport ...				3	11	1		1	1	7	10	1
<b>South Carolina:</b>												
Charleston .....		2		2	23			1		7	12	
Columbia .....		1			5				1	1		
Greenville .....							490,000	1		3	4	
<b>Tennessee:</b>												
Knoxville .....		1			6							
<b>Texas:</b>												
Beaumont .....				2	3	2	330,000	1		2	4	3
Temple .....	34,050	1										
<b>Virginia:</b>												
Danville .....				1	2		280,000	2		3	16	
Newport News ..	162,000	1										
<b>Washington:</b>												
Seattle ...	2,551,995			253de	1,068e		13,183,536			760e	1,781e	
<b>Wisconsin:</b>												
Eau Claire .....								1		1	6	

a—Patrol gang. b—Four gangs of eight men, foreman and team, each cleaning gutters and macadam streets. c—Blocks.  
d—Also twelve autos. e—Days of service, first six months of 1913.



## EMPLOYEES.

City	Sq. yds. cleaned per week	Flushing				Total on street cleaning						
		Fore- men and inspect- ors	Me- chanics and other skilled laborers	Teams	Un- skilled laborers	All others	Sq. yds. cleaned per week	Fore- men and in- spectors	Mechanics and other skilled laborers	Teams	Unskilled laborers	All others
<b>Alabama:</b>												
Gadsden .....										1	2	
<b>Arkansas:</b>												
Fort Smith .....							595,000	1		2	5	
<b>California:</b>												
San Francisco ...	90,000		1	7			5,654,100	20	3	61	132	
<b>Dist. of Columbia:</b>												
Washington .....	620,000	3	7	15		10	26,755,351	21	22	101	273	20
<b>Illinois:</b>												
Alton .....										1	4	
Canton .....							52,500			3	16	
Evanston .....							458,670	2	1	4	8	
<b>Indiana:</b>												
Logansport .....								1		1	10	
Richmond .....								1		1	6	
<b>Massachusetts:</b>												
Lawrence .....								1		3	48	
New Bedford .....								5b		10	101	
<b>Michigan:</b>												
Ann Arbor .....							860,700			3	7	
<b>Minnesota:</b>												
Mankato .....	150,000		1	1	1		190,000		2	2	6	
Minneapolis .....		7		18	33			24		48	160	
St. Cloud .....												
<b>Mississippi:</b>												
Vicksburg .....								2	9	4	9	
<b>Missouri:</b>												
Kansas City .....										27		225
<b>Nebraska:</b>												
Omaha .....	749c	2		8	8		1,404c	4		12	83	
<b>New Jersey:</b>												
Long Branch .....							210,000				5	
Paterson .....							80 ml.	3		6	62	
Trenton .....							4,410,504		72	14		
<b>New York:</b>												
Hudson .....							180,000	1		3	10	
Ogdensburg .....				1	3							
Schenectady .....				6				2	60	6		
Watertown .....	230,000	1		1	2		1,622,000	3		5	27	
<b>North Carolina:</b>												
Asheville .....		3		3				6		6		
<b>Ohio:</b>												
Cleveland .....	2,223,402	9		31	10		37,923,276	42		92	398	
Elyria .....	400,000			1			800,000	1		3	11	
Lima .....				1				1		7	9	
Sandusky .....	16,000			1			366,000			4	5	2
<b>Pennsylvania:</b>												
Butler .....					6			2		2	6	
Chester .....								1	1	7	15	
Farrell .....							140,000	2		2	8	
McKees Rocks ..					5			1		1	8	
Warren .....								4		1	4	
Williamsport ...								1	1	10	21	1
<b>South Carolina:</b>												
Charleston .....								3		9	35	
Columbia .....					1			1		1	7	
Greenville .....	490,000			3	4		980,000	1		6	8	
<b>Tennessee:</b>												
Knoxville .....		1		5	11							
<b>Texas:</b>												
Beaumont .....		2		2	5			2		2	5	
Temple .....							364,000	2		4	7	5
<b>Virginia:</b>												
Danville .....							366,605	1		3	6	
Newport News ..							442,000	3		4	18	
<b>Washington:</b>												
Seattle .....	89,298,467			718e	2,214e		105,033,998			1,731	4,063	
<b>Wisconsin:</b>												
Eau Claire .....								1		1	6	

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NOVEMBER 6, 1913.

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## Collection of Garbage and Ashes.

Probably the most unsatisfactory part of the entire service of municipal housekeeping, from the point of view of convenience to the citizens, is that of collecting garbage and ashes. The unsightliness of the miscellaneous boxes, pails and barrels which line the curbs on collection day in some cities; the noise of the steel wagons and the dropping of the emptied ash cans (which are especially objectionable if collections are made at night), and especially the odors, and, in some cities, the drippings of the garbage wagons and the dust from the ash wagons, make these collections the worst of public nuisances, which are tolerated only because they seem to be necessary.

Are they necessary? We do not believe it, but feel certain that a way can be found to avoid them. We describe elsewhere two methods which go far toward removing the nuisance of garbage collection—the duplicate pail system and the wrapping of garbage. The former would seem to be more expensive, both in the number of cans required and in the greater number of trips necessary to carry a given amount of garbage; but on the other hand, as the cans are not uncovered in the street and are thoroughly cleaned at every collec-

tion, it would seem to meet every requirement of sanitation. Wrapping of garbage would seem to be inapplicable where it is fed to swine, and undesirable if reduction is employed; but it calls for no added expense, and in fact saves in cost of both collection and incineration. The latter method is used exclusively in at least three cities, and probably more. The former method is (unless it has been recently abandoned) used in at least five cities; but two or three others have discontinued it after a short trial, presumably on the grounds of expense.

These show that methods can be found for abating the nuisance. One or the other of them would seem to be adapted to conditions in almost any city. Probably other and better ones could be devised if serious consideration be given to the subject. For the ash nuisance no remedy seems to have been found except the use of gas instead of coal; but for this problem also there must be some solution which will prevent the covering of clothing and filling the eyes of passers-by with wind-blown ashes.

## Wagons for Collecting Refuse.

Most cities set a limit to the size of cans which may be used for garbage and ashes, because of the difficulty of raising heavy cans into the collecting wagons. It is reported that a considerable proportion of the men engaged in collecting city refuse, in the larger cities at least, suffer from strains and rupture caused by lifting heavy cans.

It seems to us that sufficient attention is not paid to the possibility of minimizing the severity of this work by lowering the sides of the wagons into which ash and garbage cans are to be dumped. Most of these are five feet or more high above the street, and every inch above three feet six inches is a serious addition to the strain of lifting. Why cannot all wagons used for this purpose have the bodies hung low, to within, say, one foot of the pavement; or with low sides, making up the capacity in length? Not only would this be easier on the men, but we believe there would be a saving in time of dumping cans into such wagons which would much more than compensate for any additional cost. Low hung bodies are used in some cities for rubbish (which is much lighter than other refuse) in order to obtain greater capacity, and it is certainly possible to use the same running gear for lower and longer bodies.

For collecting street sweepings, also, low wagons would offer an advantage, in that the dirt could be thrown into them with less effort, more quickly and with less scattering of the material over the street again.

## Removing Snow from Sidewalks.

Every city, probably, has ordinances requiring all sidewalks to be cleaned within twelve hours, more or less, of the termination of a snow storm. No city, probably, enforces this ordinance except spasmodically. The penalty is generally a payment to the city for doing the work by city employees; and most cities find it impracticable to collect this from non-residents—the worst offenders in many cities. In any case it must be two or more days after the storm ends before all pavements are cleaned by the city gang, and meantime tax-paying pedestrians suffer.

The sidewalk is as much a part of the highway as the street crossings, which the city is expected to clean; or as the roadway, which the larger cities clean. Why should not the city clean the sidewalks?

Some cities do this to a greater or less extent, sending a horse-drawn sidewalk snow plow through the principal

streets first and gradually extending this service to the side streets also. Generally this plowing is in the nature of a "first aid" only, leaving a three-foot to five-foot path fairly clean, with a bank of snow along the gutter side of the walk. For this purpose the street cleaning teams may be used. Sweepers and flushers cannot be used at such times, and each team provides for two one-horse snow plows. Both sides of a street one mile long can be cleaned in an hour by one plow. Thus a two-horse team, beginning work at five in the morning, could have twelve miles of sidewalk passable for pedestrians by eight o'clock.

By running a narrow plow first, cleaning a path along the curb, and following it up later in the day with a wider plow (or by adding wings to the narrow one), throwing the balance of the snow from the walk into the gutter, practically the entire walk for twenty miles could be cleaned in a day by each two-horse team, the first path over this distance being completed before noon.

Manufacturers can furnish plows adapted to this service. The expense of operation is not excessive, especially when the city street cleaning department owns its teams. Owners might still be expected to give the walks a final cleaning, but this work would be very light. A good path is provided on *all* walks, and much earlier than if left to the owners. It certainly seems worth considering.

#### STREET CLEANING RECORDS.

On another page is an article describing what is probably the most complete and satisfactory system of records of street cleaning kept by any city in this country. We were especially desirous of obtaining this description because there probably are not more than half a dozen cities in the country which keep records of this kind which could be said by the most charitable to be complete or satisfactory. The following statement on this point is made in the latest report of the Census Bureau.

Probably in no other department of municipal administration are physical records so imperfect as in that of street cleaning. Comparatively few cities have accurate records of the area subject to the different methods of cleaning, the hours or days or service devoted to the areas cleaned by the different methods, or the quantity of street sweepings and snow and ice removed, and even fewer have ever made computations to determine the cost of cleaning per unit of service rendered, such as the cost of cleaning per square yard or per million yards of surface. Moreover, it was impossible in many cases for census agents to obtain correct information on the number of times streets were actually cleaned during the year. Apparently there was no regular schedule in many cities, and the frequency of cleaning depended upon a variety of circumstances. This was especially the case with respect to cleaning by flushing, the frequency of which depended to a large extent upon weather conditions.

Few as the cities are which keep such records, we believe that they differ among themselves in the methods of recording and even in the units employed in this. We are glad to say that the number of cities which keep records of this kind is constantly increasing, and in view of this it is very desirable that there should be a general agreement among them as to the units in which their records are stated, and also as to the general methods of keeping these records. This point was discussed at some length by the Census report to which we have referred, as follows:

Street cleaning comprises all regular and occasional cleaning of streets and alleys by sweeping, raking, flushing or washing. It includes the sprinkling of streets and alleys with water to lay the dust preliminary to their being swept or washed, but includes no other sprinkling with water or other substances, all other sprinkling being included as part of the dust prevention of the street and general highway service. It includes the raking and sweeping of streets and alleys to remove refuse that has fallen upon them, but

not the removal from streets and alleys of ashes and other refuse that has been deposited there by householders, nor the raking of back and vacant lots to remove therefrom the refuse that has there been accumulated, such work being part of the refuse-disposal service.

**Disposal of Street Cleanings.**—The disposal of the street refuse removed by street cleaning is to be differentiated as fully as practicable from that of the work of street cleaning proper. If street cleanings are hauled away by the pick-up teams and dumped upon land, the services of the teams and teamsters should be included as part of the work of street cleaning, and the only expense for disposal will be that of the services of men at the dumps for leveling off the land, etc. In case the street cleanings after being hauled to a dump are transported by rail or boat to a place of final disposal, the cost of disposal should include the expenses above mentioned, together with the costs of transportation and all expenses incidental to such transportation to the place of final disposal.

**Methods of Street Cleaning.**—In the cleaning of streets and alleys American cities make use of the following different methods or processes: (1) Hand sweeping, (2) horse or motor sweeping, (3) flushing or washing, and (4) gutter cleaning. Under (1) are included all sweeping or cleaning of streets with hand brooms, small pick-up machines and other apparatus operated by human labor. Under (2) is included all cleaning by horse or motor-driven apparatus for sweeping the streets, whether combined with pick-up devices or not. Under (3) is included all cleaning of streets by the use of water, by machine flushing, by hose flushing, or by washing with what are called "squeegees" or other devices. Under (4) is included the cleaning of gutters of unpaved streets when such cleaning is not associated with any sweeping, scraping or other cleaning of the general street surface.

The work of gathering up street cleanings from the gutters after the processes mentioned in (1), (2) and (3) is in reality a part of the work of cleaning streets by those methods and should be so treated in the accounts and records. If, however, any city desires to keep separate accounts and make separate reports of the cost of this pick-up service, it should differentiate it so as to show the amount and cost of such service for each class of street cleaning and also the quantity of cleanings removed.

**Physical or General Methods.**—The physical or general street-cleaning records of cities should follow the same classifications as are employed in the financial records. They should show for each kind of street and alley, classified according to the character of surface, (1) the length in miles and area in square yards subject to regular cleaning; (2) the length in miles and area in square yards that were cleaned one or more times during the year but not subject to regular cleaning every week; (3) the length in miles for which the only cleaning was that of the gutters; (4) the quantity of cleanings collected; (5) quantity of snow and ice removed, stated in tons or cubic yards; (6) area (square rods) of territory from which the snow was removed, and (7) the number of snowfalls for which the service was performed. The area and length of streets thus recorded for street cleaning should be entered under titles "streets regularly cleaned," "streets occasionally cleaned," "streets with gutters only cleaned," and "quantity of cleanings collected" or "snow removed" in tons or cubic yards.

With records thus kept it will be easy to report at the close of every fiscal period the aggregate of surface cleaned by each method and the quantity of cleanings for each class of streets, and the quantity of snow removed as above set forth, and given under the designation "area of cleaning done," or "square yards of cleaning," and "tons" or "cubic yards of cleanings," and "tons" or "cubic yards of snow removed," etc.

In addition to the foregoing general or physical records which are needed to correlate with the financial accounts in order to show the costs of such service per unit of area of street surface cleaned or freed from snow and per unit of cleanings or snow collected, other records are required to give all the data necessary for a complete understanding of the service. These are detailed records of the equipment, including horses, machines and other apparatus, the average distance the refuse or snow is hauled, and the number of employees of the various classes in the service. Moreover, the general and physical records, as well as those for expenses, should take account of the character of the pavements cleaned or freed from snow; for without knowledge of this kind it is impossible to determine the efficiency or economy of the service in different cities or in different parts of the same city. This may be seen from



the fact that New York City in 1907 by experiments demonstrated that granite-block pavement was 40 per cent and cobblestone pavement 20 per cent more expensive to clean than sheet asphalt.

Another factor of almost equal importance to be considered in connection with street cleaning and, to a lesser extent, with snow removal, is the state of repair of the pavement to be cleaned. The experiments in New York City in 1907 also demonstrated that it cost 20 per cent more to clean a pavement in fair condition and 40 per cent more to clean one in poor condition, than to clean one in a good state of repair. The records of street cleaning properly kept take on under these circumstances an additional importance from their relation to the general highway service. The figures quoted show that the costs of street cleaning must be taken into account in considering the frequency with which streets should be repaired and resurfaced; for without statistics from the street-cleaning service as to the cost of cleaning streets in different states of repair, the persons in charge of the general highway service lack important data for the proper guidance of their labors.

Another class of data with reference to street cleaning which should be provided by the general or physical records of cities is that which shows the proportion of the area cleaned in the business section of the city to that in the residence section. The former area is always more expensive to clean than the latter, and without taking this fact into consideration no just comparison of street cleaning expenses can be made between the different cities. Information is also desirable as to the area in square yards of streets cleaned per day or per week by more than one method, and thus the extent of the area so cleaned that is contained in the total. To aid in interpreting records and statements of costs per unit of work or of service, city records should set forth the kind or type of machine used in cleaning each kind of pavement, the method of using each class of machine, the number of miles of street car tracks on streets, and should state whether the street cleaning requires preliminary sprinkling. Accurate records should also be kept of the number of men and of horses employed in street cleaning, and snow and ice removal, and the aggregate number of days' service by each.

We would suggest one or two changes in this scheme. The transportation of the street dirt from the street to the dump or other point of final disposal should not, in our opinion, be included in the street cleaning but should be considered as a separate item. The principal reason for this is that the distance hauled is variable in different cities, in different streets of the same city and even in different years for the same street, as the dumping grounds become filled and new ones are used; and it does not permit a proper comparison of the costs of different methods of cleaning, where the haul may not be the same for all.

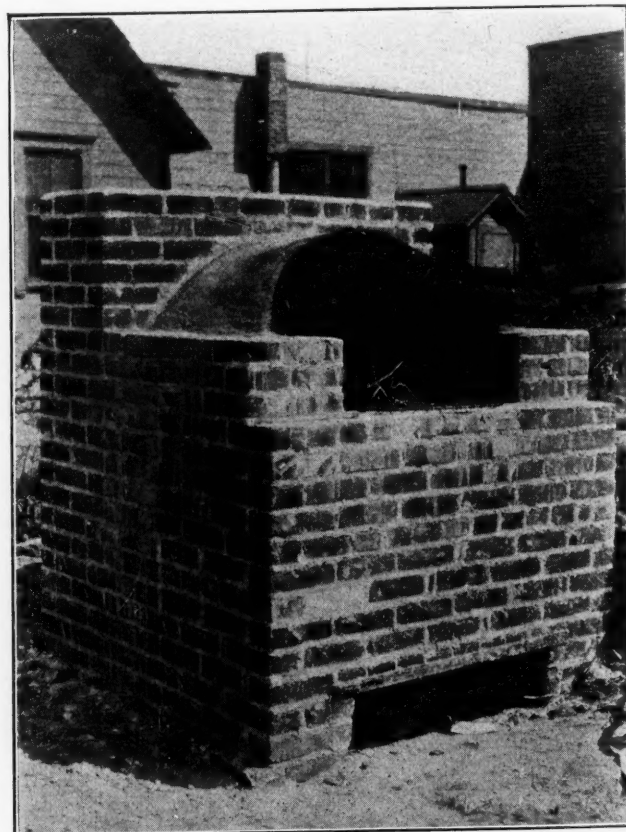
Another change which we would suggest would be the substitution of "smooth," "rather rough" and "very rough" pavements, rather than giving the classification according to the kind of surface material employed, such as asphalt, brick, and so forth. The reason for this is, that asphalt or other smooth pavement which has become badly worn may be rougher and more difficult to keep clean than other pavements which when new are considered as fairly rough. The difficulty and cost of cleaning do not ordinarily vary so much with the materials as with the roughness or smoothness of the surface. A brick pavement may be as smooth as new asphalt or as rough as cobble. Moreover, the materials employed are so numerous that it would complicate the classification unnecessarily, in our opinion. The classification proposed would be for three classes of pavements only, with a fourth class for unpaved streets, such as macadam, gravel, and so forth.

We would also substitute great square of 10,000 square feet for square yard as the unit of area cleaned. The amount of cleaning done in the larger cities runs into the millions of square yards per year, and in even the smaller cities into the hundreds of thousands. These are fairly large figures to handle, and the use of the

great square instead would reduce the length of each number by three figures. The numbers would still read in the hundreds and in the thousands, and would therefore permit accuracy within less than one per cent in the smaller cities and one-tenth of one per cent in the larger cities, an accuracy probably greater than that possible to obtain in the records themselves. Also, all measurements are taken in feet, and the labor of reducing these to yards seems unnecessary.

#### LOCAL RUBBISH BURNERS.

For the past several years the residents of Glendale, California, have been bothered by paper and other burnable material from the residences and business houses, especially the latter, blowing onto the streets and thereby causing the thoroughfares to present an unbeautiful appearance. After several experiments the officials have decided that brick incinerators, placed behind business structures and in other convenient places, afford the only



SMALL REFUSE INCINERATOR.

remedy for this trouble. The merchants are taxed for the construction of the incinerator in their district, although the officials believe these furnaces will pay for themselves within a year. Certain hours in the day are designated for the burning of material.

These incinerators are four feet square and five feet high at the back. Each is equipped at the front with an opening through which the material to be burned is thrown, this opening being 27 inches in diameter at the base and the top being of an oval shape. This opening is covered by a wire screen having a 2-inch mesh. The draft hole at the bottom is 8x27 inches. The bricks above the hole are supported by a 1-inch strip of angle iron. The chimney hole, over which there is a screen having a half-inch mesh, is 6x27 inches in size. The interior or fire box of the incinerator measures 3x3 feet and has a grate made of 1-inch angle iron. These incinerators cost \$17 complete.

# The WEEK'S NEWS

New York State Highway News—"Good Roads' Days" in Kentucky, Florida and Nebraska—Eugene, Oregon, Sewer System Completed—Great Water Power Projects—Fire Waste Inspection in Grand Rapids—New Fire Auto Apparatus—The Garbage Question—Cities and Public Utilities—Grade-Crossing Decisions.

## ROADS AND PAVEMENTS

### New York State Highway News.

Binghamton, N. Y.—The State Highway Department will expend the sum of \$35,968 as State aid for the construction of various town highways in Broome county if the 16 towns will raise the sum of \$44,274 in highway improvement taxes for the coming fiscal year of 1914. This means that \$80,242 will be expended in this county during 1914 for roads constructed under State aid provisions. The estimates of the amounts of State aid which each town will receive during the coming year were received by County Superintendent of Highways Charles Van Amburgh today. Following are the estimates, giving first the amount of tax necessary to be raised, next the amount of State aid which will be received if such a tax be raised, and, lastly, the percentage of proportion which the State aid bears to the tax raised:

Barker, town, \$2,563; state, \$2,050; 80 per cent. Binghamton, town, \$1,475; state, \$1,475; 100 per cent. Chenango, town, \$2,608; state, \$1,825; 70 per cent. Colesville, town, \$5,000; state, \$4,000; 80 per cent. Conklin, town, \$2,250; state, \$1,350; 60 per cent. Dickinson, town, \$437; state, \$218; Fenton, town, \$2,407; state, \$1,925; 60 per cent. Kirkwood, town, \$2,358; state, \$1,650; 70 per cent. Lisle, town, \$2,532; state, \$2,025; 60 per cent. Maine, town, \$2,750; state, \$2,475; 90 per cent. Nanticoke, town, \$1,075; state, \$1,075; 100 per cent. Sanford, town, \$5,195; state, \$4,675; 90 per cent. Triangle, town, \$1,862; state, \$1,675; 90 per cent. Union, town, \$3,800; state, \$1,900; 50 per cent. Vestal, town, \$3,112; state, \$2,800; 90 per cent. Windsor, town, \$4,850; state, \$4,850; 100 per cent.

Albany, N. Y.—The redistricting of the State Highway Department has been announced by Commissioner John N. Carlisle. The State is divided into nine divisions with an engineer in charge of each division. They follow:

Division No. 1: Counties of Suffolk, Nassau, Westchester, Putnam, Dutchess, Columbia, Greene, Ulster, Orange and Rockland. Engineer, Bertram F. Wait, New York, new appointee; headquarters, Poughkeepsie; \$10,972,000.

Division No. 2: Counties of Albany, Rensselaer, Schenectady, Saratoga, Washington, Warren, Essex and Clinton. Engineer, Harvey O. Schermerhorn, Troy, new appointee; headquarters, Albany; \$8,331,000.

Division No. 3: Counties of Lewis, Jefferson, St. Lawrence and Franklin. Engineer, Theron M. Ringley, Syracuse, new appointee; headquarters, Watertown; \$6,366,000.

Division No. 4: Counties of Montgomery, Fulton, Hamilton, Herkimer, Oneida and Madison. Engineer, James H. Sturdevant, reappointed; headquarters, Utica; \$6,314,000.

Division No. 5: Counties of Broome, Chenango, Otsego, Schoharie, Delaware and Sullivan. Engineer, Howard D. Smith, Syracuse, new appointee; headquarters, Binghamton; \$6,117,000.

Division No. 6: Counties of Cortland, Cayuga, Seneca, Wayne, Onondaga and Oswego. Engineer, Charles J. McDonough, Buffalo, new appointee; headquarters, Syracuse; \$6,219,000.

Division No. 7: Counties of Wyoming, Genesee, Orleans, Monroe, Livingston and Ontario. Engineer, Perry Filkin, reappointed; headquarters, Rochester; \$5,779,000.

Division No. 8: Counties of Alleghany, Steuben, Yates, Schuyler, Chemung, Tioga and Tompkins. Engineer, Frederick S. Strong, reappointed; headquarters, Hornell; \$5,641,000.

Division No. 9: Counties of Niagara, Erie, Chautauqua and Cattaraugus. Engineer, William E. Acheson, Troy, new appointee; headquarters, Buffalo; \$7,593,000.

### Good Roads' Days.

Frankfort, Ky.—Following the proclamation of Governor McCreary, "Good Roads' Days" were celebrated all over the state. Rains hindered the work on the two days, but a great deal was accomplished. There is a movement on foot here to ask the governor to designate additional days in order to make up for the effect of the rain. Observance of the day was pretty general in the mountains, and roads long needing attention were mended. In a number of sections model roadways have been planned. One of the first men on the job was Governor McCreary, who, despite his seventy-five years, did as much work on the river road near Frankfort as did many of the younger men who turned out to heed the governor's proclamation. Commissioner of Roads R. C. Terrell spent the day at

his chief's side and helped the governor dispose of the crushed stone purchased by the executive himself to fill in bad places on the roadway. In Carter county the circuit court was adjourned by order of Judge M. M. Redwin and attorneys, litigants and court attaches were urged by the judge to help the good work along. Marion county chose the day before those designated by the governor and 400 men and 100 wagons from Marion worked on the four roads leading from the city until the rain stopped them at noon. In Warren county County Engineer Cramp and Superintendent White organized the common schools. Business men and farmers of Augusta co-operated and held "Good Roads' Days" on two later days than those designated by the governor. In Henderson county, under the direction of Engineer Kimmel, the citizens cut down hills, spread gravel and rock, cut brush and removed stumps. The county superintendent of Nicholas county ordered all school boys over 14 and all teachers to work on the roads. Caldwell county, on account of the fair, changed the date of the days. In Middlesboro, Mayor Helburn and Senator Bosworth headed road gangs. In Letcher county Road Engineer Lewis offered a money prize to the school children building the best piece of road fifty feet long and twelve feet wide. The big corporations making developments of the coal fields of the county gave their employes a day off and urged them to put in that time, at least, to commemorate the governor's proclamation.

Ocala, Fla.—Fully five thousand people from every section of Marion county worked and made the Blichton road working day a success. Shortly after daybreak the various workers congregated at the board of trade rooms and until about 9 o'clock automobiles and carriages were kept busy carrying them to their respective districts, between here and the Levy county line. Practically all the county officials, Mayor John D. Robertson and city officials, the Ocala Rifles, and a large majority of the merchants and professional men of Ocala assisted in the work. Gov. Park Trammell, whose acceptance to be present and assist in the work was received several days ago, failed to come, being detained by official business. Practically all of the work planned for the day, the building of about eighteen miles of hard surfaced road, was completed. The finishing work in a few places will be completed at once by the county.

Norfolk, Neb.—In response to Gov. Morehead's proclamation practically every road leading out of Norfolk has been visited by volunteer workers. The rain brought out the road drags on many of the county roads. County Commissioner Fred Terry, who supervised the repairing of roads during the two "good roads days," reports that approximately 100 persons were at work in his district. The result of the work is better roads throughout the country. Other commissioners report that work is going on in all directions. One of the most important roads to be worked on during the day was South First street about three miles south of town, where Commissioner Terry had a large force of men and teams filling up a swamp. Former Commissioner Burr Taft was busy with a force of men on North First street and the roads in the vicinity of the state hospital for insane. These roads needed overhauling badly and the dragging put them in elegant condition. South Thirteenth street, or the Madison-Norfolk road, three or four miles of which are oiled, was looked after by J. A. Askey and several good roads men. A large number of holes were filled up and the road was put in good condition. On the Battle Creek road and roads north of that town, Commissioners Sunderman and Purdy scattered workers in all directions. One almost impassable



sandy place was clayed, while big holes were filled in. Mayor Verges and the other members of the city's official staff were at work all day.

#### Oppose \$50,000,000 Roads.

Shamokin, Pa.—The proposed \$50,000,000 state road loan to be voted on next November came in for considerable discussion at the session of the United Mine Workers of District No. 9. By unanimous vote the delegates resolved to go into Northumberland, Schuylkill, Columbia and Dauphin counties and do all they could to defeat the loan. Several delegates claimed that at the last session of assembly the senate seemed to take particular delight in smothering bills in favor of underground toilers, and now since the senate's pet \$50,000,000 loan bill is up for consideration, it was time for miners to oppose it, and incidentally take a slap at the senate.

Bloomsburg, Pa.—The \$50,000,000 road loan was unsparingly condemned by the Pomona Grange, No. 5, including the subordinate granges of Columbia and Lower Luzerne counties, at the district meeting at Millville. "We affirm our unalterable opposition to the \$50,000,000 road loan," said the grangers in resolution adopted, "because it is unnecessary, unwise and will lead to extravagance and wastefulness. The slogan of the grange is 'pay as you go'—'Business roads, not boulevards.'"

#### Wire-Cut Lug Block for Oswego, N. Y.

Oswego, N. Y.—Commissioner of Works C. W. Linsley has received samples of wire-cut lug paving brick, the recent development in brick paving, which he plans to use in East Bridge street between First and Fourth streets. John Henrick to whom the contract was granted a few months ago, agrees to a change in the specifications from the vitrified brick which former Commissioner John Smith planned to use, and enough brick will be ordered so that with an early spring delivery there will be no delay in starting the paving work and rushing it to an early completion. Wire-cut paving blocks, according to Commissioner Linsley, have been found to give great satisfaction wherever tried. Their cost is the same as the variety in use here in the past and if the results on the East Bridge Street pavement are satisfactory, they will be specified exclusively on all future contracts.

#### Experimental Road for Idaho State Highways.

Pocatello, Ida.—The first mile of the state highway to be constructed in Idaho will be made between Pocatello and Portneuf and will be built of sand and clay. The state highway commission, which met here recently, has ordered this construction. State Engineer Smith, in company with Chairman Theodore Turner has examined the roadbed and pronounces it first-class for the materials to be used. It is the purpose of this commission to construct roads of material in the locality to reduce the cost. The county's share of the expense will be about \$800. Upon this test mile of road will depend somewhat the material and manner of construction of many miles of the state highway.

#### Thirty Miles for Rock County, Wis.

Janesville, Wis.—Road work in Rock county for this season has practically been completed, according to County Highway Commissioner C. E. Moore, and approximately thirty miles of new highway will have been built and four miles of county road resurfaced before winter sets in. Highway work is being finished in the town of Clinton. Contractor Daniel Drew has two pieces of road, 400 and 4,500 feet long, to complete in the town of Union; P. W. Ryan and Sons have a mile and a half to resurface in the town of Porter, this being part of three miles on new road, and there is a small piece to be built in the town of Magnolia. Gravel and clay with a stone foundation have been the materials used in constructing all new highways this year. All the work done in the following towns: A mile in Clinton, mile and two-thirds in Union, mile and a quarter in Johnstown, and a mile and a half in Harmony, was of the all-gravel type. In the towns of Newark and Avon

no gravel is available. Two roads entirely constructed of rock rubble were built in these some time ago, but they are rough and unsatisfactory and no more work of that kind will be done. Rock will have to be crushed to give them proper surfacing. Gravel found in the towns of Harmony, Johnstown, Milton and Lima is entirely too coarse for road material as it comes from the pit, but if provision were made for crushing it would make the best possible road metal. Water-binding will be employed by Contractor Wheeler on the road he is completing in Clinton. Stone flag foundation is used where the gravel is inferior or the roads are in low and wet spots. No crushed rock macadam road has been built in Rock county except the piece built in the town of Clinton some years ago by the United States government. It has held up well and the foundation is in good condition, but it is in need of resurfacing. It is probable that no more road of that type will be built in this county. Road Commissioner Moore reports that the sentiment for good road building is rapidly growing in Rock county. Each piece constructed creates a demand for more and every farmer who becomes the owner of an automobile becomes a booster for good roads.

## SEWERAGE AND SANITATION

#### Big Sewer System Completed.

Eugene, Ore.—Eugene's new system of trunk sewers, which has been under construction for over a year, is now finished and ready to be accepted. This trunk sewer, five miles in length, which drains the entire city, has been constructed at a cost of more than \$156,000, and stands equal in size to any piece of sewer construction on the Pacific coast, Spokane excepted. Portland, Seattle or San Francisco have no larger trunk sewers than has Eugene, and Eugene has a sewer which will serve a city of 100,000. In its construction there have been used 400 tons of steel for reinforcement, and 4,500 tons of cement. First inspection was made during the week by members of the city council and the engineering staff, preliminary to the final delivery of the new system. One great concrete, monolithic tube extends underground from hills in Fairmount to the river below the city. Soon all Eugene's waste will pass into the river through the outlet below Eugene. City officials who have made inspection are enthusiastic over the new structure. The new system empties into the river at Polk street, it goes south to Sixth avenue, turning east on Sixth. One branch, however, continues south on Polk for three blocks. This is an 18-inch branch, designed to gather the sewage in the extreme west part of the city. Lateral feeders are now being built to this. A second branch comes into the Sixth street trunk on Van Buren street. This runs south 36 inches in diameter for three and a half blocks, and 24 inches in diameter for two and a half blocks up to the alley between Twelfth and Thirteenth. From that point it becomes 22-inch sewer running southward and eastward until it reaches Fifteenth street in the alley between Lincoln and Charnelton. From there it is an 18-inch sewer tapping the entire College Crest district southwest of the city. But the main sewer, a veritable subway, continues east on Sixth avenue to the alley east of High street. Here it turns again, running south to Ninth. Another branch continues south in the alley to Tenth street. The main trunk continues east on Ninth. First is a 24-inch pipe, but east of Patterson it is 18-inch until it reaches a point three blocks past the university on Franklin boulevard in Fairmount. At this point it crosses the tracks and connects to a system of feeders that have been built like the fingers on a hand reaching into every portion of Fairmount. Councilman W. A. Bell, as chairman of the sewer committee, is the originator of the new trunk sewer. He saw the demand of the future for one sewer that would empty all the refuse into the river at a point below the city. It was he who caused the plan of two sewers to be abandoned, and with the city engineer he set about to plan the one outlet. This was two years ago. A year was spent to perfect these plans. H. D.



Forneri, city engineer, has engineered the entire undertaking from drawing up the first plans and specifications, to the making of the monthly estimates upon the work of the contractors. Mr. Forneri is the engineer who laid out the plans for the present Minneapolis street car system. He has been directly assisted by F. E. Semon, assistant, and by F. W. Cameron, city inspector. Construction began a year ago this month. The contract was let to the James Kennedy company, a North Dakota concern that had just completed in nine months a half million dollar sewer contract in Spokane. The following figures give the length and size of the pipe in the new trunk sewer system:

Diameter of Sewer.	Distance in Feet.
90 inches.	4,550
88 inches.	8,046
84 inches.	1,940
75 inches.	1,657
72 inches.	803
64 inches.	1,220
52 inches.	1,390
48 inches.	400
24 inches.	516
18 inches.	4,000
15 inches.	970
10 inches.	1,980

#### Typhoid.

Wichita, Kan.—Impurities in surface water have caused an epidemic of typhoid fever in Wichita. Foul refuse in the drainage canal has caused an epidemic in the east end along the canal, and shallow wells in an outlying district cut off from water mains has caused the second epidemic, reports City Physician W. T. Doherty. There are thirteen cases of serious illness from typhoid now reported to the health department.

Newberry, S. C.—An epidemic of typhoid fever has been threatening the community for the past few days. Four cases have developed within the last week and six more are ill with malaria. No cause has been assigned for the typhoid fever as yet. The faculty of the college and the city health authorities have gone over the college premises and fail to find any cause for infection. The men who now have the fever are from the swamp sections of the State and very probably contracted there. Still, every effort is being made to stamp out the disease. All the water used by the college comes from the city artesian well. This water has been analyzed and shows no infection. The students have been warned against drinking water from any surface well.

#### New York City's Health Bureau Reorganized.

New York City, N. Y.—Work has been begun on the complete reorganization of the Department of Health, ordered at meeting by the Board. Rumors that radical changes in the department were to be made had been current ever since the retirement of Dr. Walter A. Bensel, Sanitary Superintendent, on October 1, after twenty-one years of service. Dr. Bensel had charge of several branches of the department, the work of which is now being distributed to new bureaus. There are to be eight bureaus, each with a chief, who will report directly to the Health Commissioner. Dr. Ernst J. Lederle, president of the Board of Health, who has given much thought and study to the subject, believes administration expenses will be no higher under the new system and that public health business will be expedited. The newly constituted bureaus, some of which have new names, are: Sanitary, Records, General Administration, Food Inspection, Infectious Diseases, Hospitals, Laboratories and Child Hygiene. The Bureau of General Administration will devote itself to efficiency and economy. Each bureau is to have a different color of paper for its documents, which will facilitate references and permit the direct and ready interchange of papers from one bureau to another. The system of accounting is also being improved and rapid reports and estimates will easily be obtainable. The members of the Board have been guided to an extent by innovations introduced in other cities, several of the salient features of the reorganization having been suggested more than a year ago by a national committee composed of representatives of health boards. Important changes are to be made in the Bureau of Records, in charge of the Registrar,

Dr. William H. Guilfoyle. It is probable that the ideas of Dr. Charles F. Bolduan, assistant to the chief medical officer, may be adopted in facilitating the reporting of disease. It is proposed to have reports made from the hospitals of all diseases, whether communicable or not. In the interest of accuracy there will be a uniform system of names of diseases. Often there have been variations in nomenclature which made it difficult for the experts in arranging their statistics. When the new mortality statistics are available a prompt report can be made on the prevalence of a given disease and means can be adopted for checking it. Officials of the department appear enthusiastic over the reorganization. It gives more initiative and authority and, at the same time, more responsibility to the heads of new bureaus.

#### Trouble from Sewer Depression.

Hazleton, Pa.—The stone arch sewer on North Wyoming street is causing considerable trouble. Last week City Engineer Youngman experienced some trouble with the sewer breaking and causing a washout under the surface of the paved street between Holly and Gum streets. Then another depression occurred on the street, this time between Fern and Spring streets. The paving on the west side of the car tracks went down for a considerable distance. Upon investigating it was discovered that the whole east side of the stone arch has given away and the water has been gradually washing the ground under the paving into the sewer. The break in the sewer was caused by the great velocity of the water against the arch at this point. Under certain portions of the street surface there are large excavations and there is no support under the concrete foundation. The strain of the traffic is beginning to tell on the weak spots in the street and it is expected that more depressions will occur in that vicinity. Considerable expense will be entailed in repairing the thoroughfare as a large portion of the paving will have to be torn up in order to repair the sewer and fill in the excavations.

### WATER SUPPLY

#### Shreveport Considers Buying Million-Dollar Plant.

Shreveport, La.—A board of appraisers, elected several months ago to estimate the value of the Shreveport Waterworks Company's property, including water and sewerage systems, with a view of municipal ownership, has reported that the plant was worth \$1,354,273. Two years ago engineers representing the city estimated that the property was worth only approximately \$800,000, and, although some improvements have been added since then, the council considered to-day's estimate far too high. The appraisal was according to an agreement between the company and the city, whereby the company was to sell at the estimated value, provided the city desired to buy. The council, after receiving the report, notified the company that, unless it insisted, the proposition would not be presented to the voters; also that if the referendum was demanded the council would strongly oppose buying at the appraisers' figure and would urge the erecting of a brand-new plant. The appraisers were George W. Fuller, New York, for the company; E. B. Black, Kansas City, for the city; Wynkeep Kiersted, Kansas City, referee.

#### New Water Supply for Winnipeg.

Winnipeg, Man.—The citizens of Winnipeg voted almost unanimously for an appropriation of \$13,500,000 to pay for the new water supply system. The phenomenal growth of Winnipeg and the paucity of its artesian well system for supplying water for domestic and commercial purposes long ago made it evident that a larger, more permanent and better supply of water must be provided. The water from the artesian system, while well adapted for drinking purposes, because of its purity, is badly suited for commercial purposes, because of the large amount of lime salts it contains. About 85 miles east of Winnipeg, in the Province of Ontario, is located Shoal Lake, and this body of water has been carefully tested by American engineers, who have made an exhaustive examination of the prac-

ticability of bringing it to Winnipeg through an aqueduct system. The passage of the by-law on October 1 and the immediate necessity of the situation will start preliminary work immediately, and it is expected that the city will endeavor to float a bond issue to provide the funds. While it is planned to have the new system in operation by July 1, 1916, provision will have to be made in the meantime to sink additional artesian wells in the northern portion of the city to take care of the immediate needs of the situation.

#### Extending Metering.

Raleigh, N. C.—Though there are about 3,300 water consumers in Raleigh, there are only about nine hundred meters in use. The city's plan is to put in from fifty to one hundred meters each month until the entire city is metered. This will cut down the large water consumption. There are now being pumped five hundred thousand gallons daily more than the amount served Charlotte, which has at least twelve thousand people more than Raleigh. Two years ago an inspection was made which showed that five hundred closets were leaking, the water simply pouring through and going into the sewer. In one particular case, where the rate was \$6 a quarter and where the people refused to put in a meter, the company installed one and made a test, finding that the amount of water which went through in one quarter amounted to \$139. The water was then served by a private concern.

#### Works Completed.

Conway, Ark.—The municipal water works system, costing \$60,000 and requiring three years for completion, has been formally turned over to the city by the water works trustees. The water supply is secured from Cadron creek and is piped to this city, a distance of six miles. The plant was built under numerous difficulties but since its completion it has been pronounced as one of the finest in the state. Thousands of feet of iron pipe substituted for wooden pipe after it was found impossible to secure a supply of water in the city, were condemned and the contractor had to remove them. This was one of the chief difficulties. A large proportion of the bonds have already been paid. The issue expires in 1920.

Fort Dodge, Ia.—The new 2,000,000-gallon reservoir constructed at a cost of \$25,440.40 on Duck Island has been formally accepted by members of the city council. C. T. Harding, of Burns, and McDonnell, engineers, of Kansas City, recommended the acceptance after various tests of the big concrete tub were made. In his recommendation, he said the job had been completed according to specifications with the exception of one slab on the roof which the contractors must repair. The final estimate on the reservoir reads:

Original price .....	\$24,807.00
Extra for having roof one inch thicker.....	608.40
For extra reinforcing steel in columns.....	25.00
<b>Total cost .....</b>	<b>\$25,440.40</b>
Previously paid .....	19,896.00
<b>Total due .....</b>	<b>\$5,544.40</b>
Less \$300 which is to be paid contractors when they have finished bond to guarantee the mortar coat on roof .....	300.00
<b>Total now due .....</b>	<b>\$5,244.00</b>

#### Water Where There Was Drought.

Bloomington, Ind.—Another night rain has gladdened the hearts of the citizens and there is now prospects of a speedy solution of the water question. The seven springs that feed the lakes where the city's water is obtained, are full and are expected to give out enough water so the city can be supplied every other day. Three wells are to be put down in the Griffy creek valley and these are expected to add enough water so the plant can run all the time. There is considerable water in the city's lakes but is a rule of the department not to use it below a certain point, both because of the danger from fire and the fear of causing the water to become dirty. The city is in a healthy condition and not a case of typhoid is reported. Dr. Leslie Maxwell and Albert Lieber came to Bloomington to investigate the water situation, as it related to Indiana university. They were informed by President Bryan that the university has its own adequate water supply. They met

with a committee of citizens, headed by W. N. Showers, and received the information that the city is to sink a series of new wells.

Murfreesboro, Tenn. Owing to the long-continued drought the supply of water available for city and private purposes in Murfreesboro had become seriously limited, and it was a fact that had a fire broken out in the business part of the city it would have been impossible to control it. But the water company put night and day forces at work excavating at the mouth of the old Murfree springs a week ago, and fortunately a strong stream was tapped, but the flow could not be directed into the reservoir without artificial means. The company immediately installed powerful pumps and the extra supply is now being forced into the reservoir, and the 100,000-gallon standpipe is kept filled as a reserve supply in case of an emergency. The spring is about 100 feet in diameter and 90 feet in depth and is never affected by the weather conditions. It is three and one-half miles southeast of Murfreesboro.

## STREET LIGHTING AND POWER

### Huge Water Power Projects.

Chattanooga, Tenn.—November 12 has been tentatively agreed upon as the date for the official celebration to mark the final completion of the lock and dam at Hale's Bar, Tenn. After five years of toil and the expenditure of \$9,000,000 by the Brady interests of New York, the huge project which marks a new era in the hydro-electrical development of the south, is now completed, and within two weeks' time the harnessed forces of the Tennessee river will be converted into 85,000 horsepower. The hydro-electric project on the Ocoee river has long been operating the traction lines of the city and supplemental dams are now in the course of construction. According to the present program, many members of Congress, including the Senate committee on harbors and rivers and, if possible, United States Senators Lea and Shields, will be in attendance. Nicholas Brady, present head of the estate of the late Anthony Brady, will also attend. Elaborate exercises will be held and special cognizance of the opening of the huge power plant will be taken by the Tennessee River Improvement Association, which will open its annual session at Sheffield on the day that the final completion of the project will be celebrated. The lock and dam at Hale's Bar is the original hydro-electric project in this section of the country being conceived by C. E. James, a prominent Chattanooga capitalist, and the late J. G. Guild before work was begun either on the Ocoee river, near Cleveland, Tenn., or at Tallulah Falls, Ga. The final completion of the dam will result in a rise of practically eight feet in the river at Chattanooga and the engineering department is occupied at present with the problem which may result from the submerging of mouths of several large sewers. Every contingency has been anticipated.

Groville, Cal.—That another mammoth power plant will be constructed in the Feather river canyon has become apparent, a syndicate of Sacramento capitalists having filed an appropriation upon the waters of the middle fork of the Feather river and upon Fall river. Included in the company are F. G. Eby, S. H. Whisner and L. F. Breuner. The appropriation recites that the water is to be used for the purpose of generating electrical power. From the point of diversion to the power plant, it is stated that the water will have a total fall of 1,000 feet. The estimated production of the plant is 60,000 horsepower. It is stated that the plant will be completed within five years. The estimated cost is given as \$360,000. One feature of the plant is an impounding dam that it is stated will impound 15,000,000 cu. ft. of water.

Cadillac, Mich.—Details of a gigantic plan to harness up the Manistee river and furnish water-developed electricity to northwestern Michigan have been given out here by Clyde E. Holmes of Grand Rapids, an attorney who has done much preliminary work in connection with the Commonwealth Power company's waterpower projects in Michigan. Mr. Holmes is here in connection with a peti-



tion filed with the Wexford County Board of Supervisors by the Western Michigan Power Company. The petition asks the right to build eight dams across the Manistee river in this county at an approximate cost of \$2,000,000. The Western Michigan Power Company is a Commonwealth subsidiary. If the supervisors see fit to grant the petition—and it is thought here they will—the Western Michigan Power Co. will start to build the dams within a short time. For ten years the Springville Land Company, a Commonwealth holding company, has been buying up great tracts along the Manistee and the Commonwealth is now ready to go ahead with its work on this side of the state. The Western Michigan Company now has a big dam on the south branch of the Manistee known as the Stronach dam. This project was completed about a year ago. After the completion of this dam Commonwealth purchased the properties of the Manistee Light and Traction Company in the city of Manistee and has since spent thousands of dollars in improving the street car line, fitting up a traction park at Orchard Beach and practically rebuilding the distribution system. The Western Michigan Company will immediately construct a transmission line from the Stronach dam and furnish power to the Cadillac Water and Power Company—another Commonwealth concern—thus doing away with the present expensive plant which develops electricity here by steam. Later, Cadillac will be served from one of the Wexford dams. Mr. Holmes also stated that the Western Michigan Company is ready to begin construction of what will be the biggest dam in Michigan. It will be built on the Manistee river at the junction of the Pine river in Manistee county, will have a head of 55 feet, and will cost approximately \$1,250,000. According to the plans the power to be developed from the eight dams in Wexford county would be sent to Cadillac, Manton, Buckley, Harrietta, Sherman, Baxter, Mesick, Glengary and other towns. The concession which the Western Michigan Company promises to the supervisors are a reduction of rates, better service and the corollary benefits of its great organization in inducing outside industries to locate in the towns where its power may be sold. In addition to asking the right to build the dams the company asks permission to send its power to any part of the state after giving Wexford county all of the current it needs. The proposed chain of dams is to be built as follows: The Yuma dam, 30 feet high; the Mesick dam, 26 feet; the Sherman dam, 60 feet; the Buckley dam, 50 feet; the Mystic dam, 60 feet; the Manton dam, 47 feet; the Baxter dam, 47 feet and the Walton dam—the biggest of the eight—65 feet high. With one or two exceptions these dams are named after the Wexford county towns near which they will be located.

#### Dothan, Ala., Plant in Commission.

Dothan, Ala.—Fires have been kindled under the 300-horse power boilers of Dothan's new \$100,000 power plant and the 400 K. W. three-phase generator was set in motion lighting the city as it has not been lighted in nearly two years. The new plant is perhaps the newest in the state. When finally completed its equipment will consist of three-horse power Heine boilers for motive power, one 400 K. W. three-phase generator driven by a 550-horse power cross compounded Corliss engine, one 200 K. W. generator driven by a compound Corliss engine, two electrically driven air compressors and two 800-gallon electrically driven centrifugal pumps. The large generator was installed by the Hardie-Tynes Co., of Birmingham. V. V. Newell, special representative of the Hardie-Tynes Co., is here inspecting the machine and adjusting it.

## FIRE AND POLICE

### Fire Waste Inspection.

Grand Rapids, Mich.—Fifty expert fire waste inspectors, under the direction of State Fire Marshal John T. Winship, have begun an investigation of fire hazards in Grand Rapids. Not a building in the downtown section will escape notice. When the work is completed an extensive report will be made to the fire marshal's department, following a meeting to be held here within one month with the Association of Commerce. Mr. Winship started with his army of in-

spectors the work under the direction of Assistant State Fire Marshal Robinson. It is expected that the local fire survey will take at least three days. The work to be done will be along the line of preventing fire waste in any form. Government statistics for September show that at least 50 per cent of the fires may be easily prevented. Fire prevention inspection is to reduce this waste to a minimum. Michigan reports for September show that property to the value of \$603,827.63 was destroyed by fire. The fire prevention inspectors come from the Fire Prevention Association, and in the number are included such well-known experts as B. A. Starr, of Lansing, president of the association; C. W. Hutchinson, secretary; George K. March, of Hillsdale, H. O. Benedict and W. T. Benallack, of Detroit. They are all specially deputized fire marshals. No only was the construction of buildings taken into notice, but also conditions of alleys surrounding the buildings, locations of the electrical wires, storage of explosives and untidy condition of premises. Nothing was taken for a fact until the inspectors had first inspected it. They carefully noted where waste constituted a menace to safety and created an extra fire hazard. The condition of gas and electric wire fixtures were given special attention. Mr. Winship explained that the inspection was in no sense an insurance inspection. He said it was a campaign for improved conditions and a greater safeguarding against fire, with a view to reducing the hazards, and ultimately the insurance premiums, as conditions are made better. Following the inspection, when the reports are made up, notice of discovered defects will be sent to the property owner or tenant and corrections of same solicited, with request to notify the secretary of the association at Detroit that the asked for changes will be made. If no reply is received in about a week a second notice will be mailed, and, provided no attention is given the matter will be taken up direct by the state fire marshal's department.

### Women in Fire Department.

Winsted, Conn.—Fifteen girls and women have been appointed members of the local fire department as a result of their efforts in raising a fund to buy an automobile fire truck. The women will be called upon to give first aid to the injured.

## MOTOR VEHICLES

### More Powerful Motor for Truck.

Ithaca, N. Y.—The Knox Automobile Company, of Springfield, Mass., has agreed to install a new and more powerful engine in the combination Knox automobile fire-fighting truck of Torrent Hose Company, No. 5. The present machine is at present equipped with a 90-horsepower engine. Experience has proved, however, since the big red machine was purchased that this engine was probably not powerful enough. Officials of the fire department have succeeded in convincing the makers that a new machine would be gratifying and would better uphold the reputation of the machine. The conditions were fully explained and word has been received that the Knox company is sending on a 115-horsepower engine. As soon as the new engine arrives the company will be notified and will send men here to install it. The new engine is given to the Ithaca fire department gratis.

### Auto Ladder for Manchester, N. H.

Manchester, N. H.—The new Robinson auto ladder truck has become part of Manchester's modern fire apparatus through its acceptance by the aldermanic committee on fire department and Mayor Hayes. The truck cost complete \$6,600. The price is usually \$6,800, but \$200 was allowed for the horse-drawn truck in Engine 3, East Manchester, which the new truck will replace. The equipment is modern in every respect. It consists of one 65 feet, one 50 feet, two 35 feet and one 28 feet truss ladders and two 23 feet roof ladders, one 20 feet and one 18 feet baby extension ladders, one 12 feet common, one 10 feet common, two plaster forks, one ceiling remover, five shovels, two ramming bars, a Detroit door opener and a Red Cross emergency kit. The committee asked to have the 65 feet extension ladder braced, and this will be done. The siren will be electrically operated, instead of manually, as at



present, that agreement being reached with the agent. Before the truck was accepted it was put to a severe test. Its hill-climbing power was tested on Sullivan street, the steepest grade in the city, and it exceeded expectations, taking the hill with ease from a dead start. The engine gives 80 horsepower. A patent lock to prevent the ladders from slipping off, ease in steering through patents controlled by this company, and the general lightness and compactness of the new truck are features of its construction. The truck carries a 50-gallon chemical tank made of hammered copper, and has plenty of room for firemen's coats, boots, hats and other equipment in a compartment slung under the chassis. The wheelbase on this truck is longer than on the average trucks manufactured by this concern, because the committee specified that a 65 feet extension ladder must be part of its equipment. Usually the longest ladder carried on auto trucks is 55 feet.

#### **Purchase Chief's Car.**

Lynchburg, Va.—At a meeting the Board of Fire Commissioners purchased a Hudson four-passenger automobile to be used by Chief Sandidge, of the local fire department, in the discharge of his duties. The machine will take the place of a horse and buggy, but since the department is already short of a few horses the animal used by the chief will be added as an extra. It has been decided to add a number of additional firemen to the department when the large motor truck arrives. It is expected about the middle of this month.

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### **GOVERNMENT AND FINANCE**

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#### **Philadelphia Bonds Sell Well.**

Philadelphia, Pa.—After three days' sale to small investors, only \$304,600 of the \$2,200,000 issue of 30-year four per cent municipal bonds remained unsold. There was a total of 529 subscribers. When the books were closed on the third day, including the \$100,000 block that the sinking fund commissioners purchased, \$1,895,400 of the issue was gone. The largest single subscription for an individual on the third day was \$50,000, and the average purchase amounted to \$3,725. Women investors outnumbered the men on all three days of the sale.

#### **Abolish Recorder's Office.**

Anderson, N. C.—The city council of Anderson has abolished the office of recorder, and hereafter the City Court will be presided over by the mayor. The office was created in 1912, and since that time the position has been held by W. H. Frierson. There has been more or less friction between the recorder and members of the police force for some time, and this had something to do with the abolition of the office. The change is already in effect, and Mayor Lee G. Holleman will preside at all sessions hereafter.

#### **Cities Expanding.**

Richmond, Va.—The annexation ordinance which has been passed by Common Council without a dissenting vote calls for the addition of sixteen square miles of territory, which would increase the present area to twenty-seven square miles. The population of the city, it is estimated, would be increased from 128,000 to 153,000. Several million dollars would have to be expended for improvements in the annexed territory. The ordinance now goes to the Board of Aldermen. No serious opposition is anticipated in that body. Citizens of Henrico county are planning to oppose final ratification of the project by recourse to the courts; but it is not believed that they will be successful in their efforts.

Richmond, Ind.—Extension of the corporation limits to take in territory which will increase the area of the city almost one-half will be made if council acts favorably on the survey City Engineer Charles is planning. At the last meeting, council instructed the city engineer to prepare a survey during the winter. The extensions which he will recommend will include Benton Heights, northwest of the city; Earlham Heights, to the west, and a large area on

the south, embracing the Abington Pike, Greenwood and Beallview. Not only would this increase the area of the city, but would add several hundred to the population, the additions under consideration being rather thickly populated. During the ten years since the last change was made in the corporation limits, the land surrounding the city has been laid out in many of the additions, and all improvements possible made. Some of the residents of Benton Heights asked for admission to the city about two years ago, but when council investigated the case enough remonstrated to keep the proposed annexation from being made. It was reported at the last council meeting that a majority of the residents were now in favor of becoming a part of the city. City Engineer Charles said he had been informed that a petition was being circulated by the citizens of Earlham Heights and vicinity asking that the corporation lines be surveyed to include that addition. Nothing is known of the feeling on the Abington Pike at Greenwood and Beallview, said Mr. Charles. He said the territory was built up with many fine cottages and should be taken into the city. Just as soon as the survey has been made, which will be during the next few months, and approved by council, the work of placing sewer extensions in the new additions will be begun and other improvements made as the citizens demand them, said the engineer.

#### **Women Run for Council.**

Chicago, Ill.—Miss Sophronisba Beckenridge, dean of women of the University of Chicago; Miss Mary McDowell, head resident of the University of Chicago Stock Yards Social Settlement, and Mrs. Joseph T. Bowen, settlement worker, will be candidates for the City Council at the spring elections, according to a recent announcement. The women will run on an independent ticket, pursuant to a campaign by the women's civic organizations, to obtain representation in the council to promote legislation in which women are especially interested.

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### **STREET CLEANING AND REFUSE DISPOSAL**

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#### **Plan Garbage Incinerator.**

Spartanburg, S. C.—Tentative plans have been made by the Board of Health to establish a garbage incinerator. After investigating the operation of such crematories in other cities they have about reached the conclusion that this method of disposing of refuse is not only more sanitary, but more economical than the system now in vogue. At present it costs the city 35 cents a load to dispose of garbage. This expense would be so greatly reduced by the incinerator, it is stated, that in three and a half years the plant would pay for itself. Reports from other cities show that disease has decreased after the installation of garbage crematories. Inquiring into the question if such an incinerator would be objectionable to the neighborhood in which it was located, the health officers have been informed that the incinerators are practically odorless in operation and can be established anywhere an ordinary manufacturing plant would be allowed. Garbage and sewage, waste matter gathered from the city streets and dead animals will be disposed of in the plant.

#### **Company Wants All Garbage.**

Grand Rapids, Mich.—Practically all the members of the Grand Rapids Garbage Holding Company attended the meeting of the board of health and poor commissioners to enforce their demand for more garbage. Last summer when the canning season was on the company received too much garbage, but with the coming of winter conditions have changed. Assistant City Attorney Ferguson has taken up the complaint and injunction proceedings will follow to prevent outside collectors from gathering the "fat" garbage at hotels and restaurants in advance of the city collectors. Two restaurant keepers have injunctions out against the city preventing its collectors from taking garbage. Now that the city collectors have been instructed to follow the court's decision carefully, it is said that the

dry garbage will be left. This arrangement may be a means of having the injunctions withdrawn, in which case the hands of the city would be untied and the several police court cases brought under the ordinance would be prosecuted.

#### Mayor and School Children Unite for Clean Streets.

Philadelphia, Pa.—The first co-operative meeting between the Department of Public Works and the children of Philadelphia in the interest of clean streets was held in the mayor's reception room November 1. Children from all the public schools in the city where civic instruction is a part of the curriculum, officers of all the Good Citizenship Leagues, members of boys' and girls' clubs, settlement house workers and city officials heard the talks and saw Mrs. Edith W. Pierce's stereopticon slides depicting the condition of city streets. Especial attention was paid to South Philadelphia. Attendance of the school children was assured through the co-operation of Superintendent Brumbaugh and Mrs. Pierce, recently appointed street inspector. Dr. Brumbaugh has requested the aid of all school principals in the movement for cleaner streets. There were addresses by the mayor, Superintendent Brumbaugh, Director Cooke, W. H. Connell, chief of the Bureau of Highways; Dr. J. Lynn Barnard, of the School of Pedagogy; Mrs. Edwin C. Grice, vice president of the Home and School League, and Dr. Carol Aronivici, secretary of the Suburban Planning Association.

### MISCELLANEOUS

#### Cities and Public Utilities.

San Francisco, Cal.—The State Railroad Commission has established a rather remarkable precedent, having ordered a corporation to extend its system that a man living in a territory where the company had no franchise to operate might be served. The Pacific Gas and Electric Company is the corporation, and Charles L. Butler, a resident of Cragmont, just outside the city limits of Berkeley, is the man.

The Pacific Gas and Electric doesn't serve Cragmont, and Butler claimed that he got little satisfaction when he pleaded with the company to supply him with either gas or electricity. Then he decided to take the case before the Railroad Commission, and the commission has directed the company to accede to Butler's request, even though it lacks a franchise to operate here. In directing that the Pacific Gas and Electric extend its system to serve Butler, the commission fixed as a condition that Butler shall not only pay the regular rate of 90 cents per thousand feet of gas charged to Berkeleyans, but in addition he shall pay \$2.25 per month to the company. This sum of \$2.25 per month will be lessened by 50 cents for each new consumer added to the line which the company is directed to build to serve Butler until five are added. No additional cost is assessed for electric service. This is one of the first cases in which the commission has directed a utility to extend its facilities. As to the company's plea that it has no franchise to serve Butler's district, the commission declared that the Pacific Gas and Electric has been laying its wires without a franchise in other districts, and the opinion states that the company will be expected to make proper application for a franchise within a reasonable time.

Terre Haute, Ind.—The Commercial Club of Terre Haute has begun a campaign for lower water, electric light and gas rates, when petitions for an investigation of the rate question were filed with the public service commission. No date for hearing has been fixed. Complaint has also been made against the rates charged by the Vincennes Water Supply Company, of Vincennes. W. C. Bierhaus and other citizens filed the petition. Requests were made in each of the four petitions for physical valuations to be made for the public utilities at Terre Haute and Vincennes. The Terre Haute Commercial Club says the rates charged in a city by a public utility for light, power, heat and water are a material and important element in promoting the growth and prosperity of a city and the extension of manufacturing, mercantile and general business interests. Now that Indianapolis gas patrons are to receive a 55-cent rate beginning next January, Terre Haute citizens cannot understand why a rate of \$1, with discounts ranging from 10 to 25 per cent, according to the quantity of gas consumed, should be

charged in that city. The Terre Haute public utilities against which the complaints are directed are the Terre Haute, Indianapolis and Eastern Traction Company, which supplies electric light, electric power and steam heat; the Terre Haute Water Works Company and the Citizens' Gas and Fuel Company. Complaint is made against the traction company that the rate charged is excessive, that the voltage is low and irregular, that an unreasonable minimum rate is charged, that discrimination is practiced by the making of special contracts, and that users of steam heat must agree to use no artificial illumination except electricity supplied by the respondent company. The Terre Haute cases will form the most important question now pending before the commission.

#### Grade Crossing Decisions.

Bristol, Va.-Tenn.—Judge J. L. Kelly, of the Corporation Court of Bristol, Va., has handed down a decision in the mandamus suit of the city against the Norfolk and Western Railway, holding that the latter must comply with the city ordinance requiring the Edmond street crossing to be opened. The city instituted the suit to compel the railroad to obey the law passed by the council in June, requiring that the steps at the crossing be restored, the crossing kept open for traffic and a flagman be stationed at the crossing continuously from 7 a. m. to 10 p. m. The city's suit was filed upon receipt of a letter from an official of the Norfolk and Western advising that it would not obey the ordinance, on the ground that there was no crossing over its tracks at Edmond street. The city council thereupon instructed City Attorney Floyd H. Roberts to proceed with legal action necessary to test the question. The mandamus suit was filed and the railroad filed a demurrer, but it was overruled. The case was finally heard on its merits and Judge Kelly took it under advisement. It was the city's contention that there is a crossing at Edmond street, and much evidence was introduced to show that traffic had been crossing at this point for many years, until the railroad removed the steps and began keeping it blocked for most of the time with trains. For several years the residents of the section of the city about the Edmond street crossing have been petitioning the city council to have the crossing opened and finally the matter was taken up in an aggressive way and the ordinance requiring the restoration of the steps and the placing of a flagman was passed.

Richmond, Va.—In a decision practically reversing its former stand, the State Corporation Commission has ordered the Southern Railway and the Washington-Southern Railway to proceed at once to construct, at their own expense, an underground crossing to replace the grade crossing at Telegraph Road, near Alexandria, in Fairfax county. In effect, the commission releases the county of Fairfax from sharing the expense of the underground crossing with the railways. Heretofore the commission has held that when grade crossings are to be eliminated, the expense is to be borne equally between the railway and the county. In the opinion, which was written by Judge Rhea, it is expressly stated that the county is relieved from its customary share in the cost on account of extraordinary conditions at this crossing. In addition, Judge Rhea goes on to say that if the railways so desire, they are at liberty to bring action against the county of Fairfax to recover one-half of the cost of constructing the underground crossing when the work is completed. The decision is not intended by the commission to establish the precedent that in the future railways alone are to bear all the expense of the elimination of grade crossings, it being stated that each case must come up on its own merits.

Hartford, Conn.—The public utilities commission has given a decision in regard to the limitation of the Sigourney and Flower street crossings, in connection with the extension of Capitol avenue, that the question of the extension of Capitol avenue must be eliminated from the petition concerning the grade crossings at Flower and Sigourney streets, and be treated as an independent matter. The decision of the commission sustains the position of the New York, New Haven and Hartford Railroad Company, and is adverse to the city. This is a victory for the railroad company, as the city had argued that the Capitol avenue extension matter should be treated as part of the general plan for elimination of all crossings in that section.



### Expert Park-Planning for Council Bluffs.

Council Bluffs, Ia.—In order to plan the system of parks in Council Bluffs in such system that future additions may be made to the present park system in an intelligent manner, and with a view to realizing a certain definite ideal, the park board is planning to bring to this city one of the best experts upon city planning that it has been able to find. Charles Mulford Robinson, one of the best known men of his kind in the entire country, who has helped to plan the park system of nearly a score of the most beautiful cities of the world, and who is now engaged in delivering a special course of lectures at the University of Illinois at Champaign, Ill., is to come here some time this month for a few days' conference over the needs and chances for betterment in this city. The park board has some ideas of its own regarding the future growth and enlargement of the city park system, but it desires to have the benefit of Mr. Robinson's advice, in order that every possible advantage may be taken of the natural resources and advantages of the city. Mr. Robinson will probably spend several days in Council Bluffs.

According to the members of the park board, Council Bluffs now has enough of the larger parks, and what it needs for the future is a series of smaller neighborhood parks in all portions of the city, together with a system of driveways or boulevards, connecting the parks the city now has. They have cast about the city, and agreed, in a tentative sort of way, that parks containing a single block of ground, for the use of the mothers and children of each section of the city, are needed in the extreme southern part of the city, not far from Manawa car line; another perhaps somewhere on Ninth avenue, which it is proposed to use as a sort of boulevard connecting Fairmount and Dodge parks; a third in the extreme northeastern portion of the city, perhaps on Canning street; and a fourth in the northwestern part of the city, perhaps about on Avenue G. Such a series of small parks, to contain about a block each, could easily be connected with driveways. The main boulevard from Fairmount park to Dodge park in the west end would pass the proposed park on Ninth avenue, while a branch driveway could be run from it on Twenty-first street to Cochran park, already a delightful spot, and thence on north to the proposed park on Avenue G, and out on about Fifteenth street to Big lake and Lakeview park. It is believed by the park commissioners that they can arrange with the water board for the use as a neighborhood park of the portions of the two blocks of ground on lower Broadway until they are needed for water purposes. A feature of this little neighborhood park, in the minds of the park commissioners, would likely be a swimming pool for the boys, who now have practically no public place for their summer's swim. The board appreciates that it will take years, probably to build up the ideal they have, and they consider it entirely probable that Mr. Robinson may have some better suggestions to offer, after he has come here and gone thoroughly over the situation, than their present plans embrace. In addition to the driveways about the city streets, which it would probably be the desire of the park commissioners to improve and beautify by trees and perhaps by oiling, they have in mind a system of driveways for automobiles. Some of these lie within the city limits, but more of them are entirely outside the city, and would have to be taken up in a more comprehensive manner than would be possible to a board confined by law to the city limits.

### Plan Municipal Delivery of Produce.

Cleveland, O.—Marketmaster Charles Kamp has declared himself strongly in favor of municipal trucks to be operated from Central and West Side markets, making deliveries for 3 cents a basket. Mr. Kamp will recommend three new trucks for the West Side market and four for Central market to the appropriations committee of the city council, provided Mayor Baker sanctions this action. He will do this on conditions the housewives do not put the stall owners or farmers to any trouble, but carry the basket to the drivers of the trucks, pay the 3 cents and give the address to which the basket is to be delivered.

### Municipalities Unite for Inland Waterway.

Brielle, N. J.—With the public machinery of almost a dozen municipalities boosting the dual projects, the work of establishing a permanent inlet at the mouth of the Manasquan river and the construction of an inland waterway connecting the head of the Banegat Bay at Bay Head with the Manasquan river, now seem almost assured. During the past few weeks approximately 1,500 signers have been secured on the petitions which are to be forwarded to Col. F. V. Abbott, the United States Army engineer who has the inlet project in hand, urging the early beginning of work on the inlet development. Wall township, Belmar, Manasquan, Spring Lake, Sea Girt, Brielle, Point Pleasant, Allenwood, West Point Pleasant and Bay Head have already taken the matter up and are urging the work. It is believed that Colonel Abbott, in his report to Congress, will urge an immediate appropriation for the work. Commis-enosir Marpaugh, of the Inland Waterway Commission, has been here upon several occasions and has gone over the proposed route for the Barnegat Bay-Manasquan river canal. The route which is proposed and which is being staked out will make necessary the construction and maintenance of but two draw bridges between the two bodies of water. The geological formation of the route is such as to make the excavation work rapid and inexpensive. It is one quarter of a mile shorter than the route which was at first considered. While the state is to construct the canal and the federal government is to stand the expense of the inlet improvement work, the two combined will effect a new development of commercialism in this section of the coast. Many advantages go to make the improvement essential. Commercially the value of the improvements jointly are manifest. It would place this vicinity on a tide-water rating with coal, stone, bricks, lumber, foodstuffs, etc., insuring a great reduction in the cost of transportation and thus reduce its retail price. It is understood that it would work a difference of 85 cents per ton in coal. The territory in the vicinity of the river and adjacent would be opened up to development on a profitable scale and the dredging of the river would be the means of reclaiming acres of lowland that now lie valueless along the river shore.

### Improving River Front.

Pittsburgh, Pa.—With the appointment of a committee of the Art Commission of Pittsburgh vested in full power to act in behalf of the Commission, the first definite steps have been taken for the improvement of the river front at the junction of the Allegheny and Monongahela rivers at a section locally known as the "Point." J. Bennett, a well-known Chicago architect, visited the grounds with the committee and a scheme of improvement was tentatively outlined. This includes the building of river walls parallel to the rivers and the beautifying of the ground between the rivers and the walls by the laying of sidewalks, avenues, and the planting of trees and grass. The special committee consists of A. B. Harlow, Henry McGoodwin, A. B. Orth and John W. Beatty, director of fine arts of the Carnegie Institute.

### Plan Municipal Drug Store.

Cambridge, Mass.—A municipal drug store is under consideration by the city government of Cambridge. The Common Council and Board of Aldermen have appointed a joint committee to discuss with the Mayor a plan for converting a portion of the basement of the City hall into such an establishment. The purpose of the proposed innovation is to supply medicines to needy families at a very low price.

### The Chicago Park Playgrounds.

Chicago, Ill.—The Park Commissioners and children of the Park Playgrounds are very active. The children of the Stanford Park Playground held a Hallowe'en celebration for the other children and their parents. A gymnasium rally has been held and medals awarded for track athletics. Illustrated lectures are being held in the Stanford Park, the last one being on "Scenic and Historic Italy." The lecture was well attended. The gymnasium, following a special appeal of the Park Commissioners, has greatly increased its attendance.



## LEGAL NEWS

### A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

#### Street Improvement Proceedings—Validity.

*Barber Asphalt Paving Co. v. Kansas City Hydraulic Press Brick Co. et al.*—The courts should be liberal in passing upon the validity of proceedings for street improvements.—Kansas City Court of Appeals, Missouri, 156 S. W. R., 749.

#### Damages from Original Grading of Street.

*City of Seattle v. McElwain.*—A city is not liable for damages to abutting property resulting from the original grading of a street, providing abutting property is not encroached upon by slopes or otherwise, and its lateral support is not removed.—Supreme Court of Washington, 134 P. R.

#### Guarding Excavation With Lights.

*Sweet v. Salt Lake City.*—A city was not negligent, as a matter of law, in failing to have lights near an excavation in a street; but the question was for the jury whether the means used by the city to guard the excavation were such as ordinary care demanded.—Supreme Court of Utah, 134 P. R., 1167.

#### Operating Electric Plant—Care Required.

*Monds v. Town of Dunn.*—A town operating an electric light plant must use that degree of care that a reasonably prudent man would use under like circumstances to avoid injuring persons coming in contact with electrically charged wires, and it is charged with a continuous duty of taking reasonable precaution to keep its appliances in proper condition.—Supreme Court of North Carolina, 79 S. E. R., 303.

#### Incorporation of Municipality—Constitutionality.

*State ex rel. Proctor v. Bay City et al.*—L. O. L., providing that any portion of a county, containing not less than 150 inhabitants and not already incorporated, may be incorporated as a municipality, having been on the statute books for many years and been acquiesced in by the public and recognized by the courts, must be held constitutional in the absence of a clear showing of its invalidity.—Supreme Court of Oregon, 131 P. R., 1038.

#### Icy Sidewalk—Liability of City.

*Jaeger et ux. v. City of Newport.*—Where the city had not undertaken the duty of removing snow and ice from its sidewalks, a pedestrian, injured by slipping upon the ice at the intersection of an alley, cannot recover, though there was a large ridge of ice, where she fell before she reached the ridge; the city being liable only when the snow or ice amounts to an obstruction, or its natural condition has been changed by artificial means, or it has undertaken the duty of removing it.—Court of Appeals of Kentucky, 159 S. W. R., 671.

#### Water Rates—Municipal and Privately Owned Plants.

*Sloan v. City of Cedar Rapids et al.*—The right of a city operating waterworks in respect to the rates that may be charged is broader than that of a private corporation; and, while the city is authorized by the Code to charge such rates as will, with the taxes, provide for extensions, a private corporation cannot include an amount sufficient to make extensions if it brings in more than a reasonable return.—Supreme Court of Iowa, 142 N. W. R., 970.

#### Library—Conveyance of Books—Ministerial Duty.

*Johnston v. City of Chicago.*—A public library voluntarily organized by the people of a city through their proper representatives for the exclusive benefit of its territory, and not of the state at large, owned and used for delivery of its books from the main library to substations an automobile, which, through the negligence of its driver, hired by the secretary of the library, collided with an automobile belonging to plaintiff on a public street. Held, that the conveyance of books by that means along public highways was a ministerial duty, for which reason the city was liable in damages.—Supreme Court of Illinois, 101 N. E. R. 961.

#### Street Improvements—Adjoining Property—Damages.

*Casassa et ux. v. City of Seattle.*—Where plaintiffs sued to recover damages by reason of a slide of their adjoining property, caused by a cut made as part of a street improvement, the measure of plaintiffs' damages depended on the final effect on the market value of the property, and hence benefits derived by the property from the change in the surface might be lawfully set off against the damages sustained.—Supreme Court of Washington, 134 P. R., 1081.

#### Liability for Ultra Vires Acts.

*Foxen v. City of Santa Barbara.*—A municipal corporation is not liable for the ultra vires acts or omissions of its servants, whether they acted with or without the express command of the municipality, since, as a municipality can exercise only such powers as are conferred by its charter or general law, it cannot authorize an ultra vires act.—Supreme Court of California, 134 P. R., 1142.

#### Bridges—Obstruction of Navigable Waters.

*Tuell v. Inhabitants of Marion.*—A municipal corporation is not liable in a private action for the negligent performance of corporate statutory duties, but is liable as an individual if the acts are not authorized by statute, and are done by its authority. Navigable streams are public highways, over which all persons have a right to pass, to float logs, etc.; and cities cannot obstruct navigation therein, unless expressly authorized to do so by statute.—Supreme Judicial Court of Maine, 86 A. R., 979.

#### Streets—Defects—Liability.

*Hardin et al. v. City of Corinth.*—A city, which constructed a bridge over a drain, gutter or ditch alongside one of its streets not forming a part of a crosswalk, but evidently built for the use and convenience of those desiring to go from the street to the sidewalk, and which was used for that purpose, was liable for injuries caused by defects therein, since, even though it was under no duty to build such bridge, it had power to do so, and, having done so, was bound to keep the bridge in reasonable repair to insure the safety of persons rightfully using it.—Supreme Court of Mississippi, 62 S. R., 6.

#### Notice of Claim—Broken Water Pipe.

*Weinstein et al. v. City of New York.*—Greater New York Charter as amended by Laws 1907, provides that no action against the city for injuries to property may be maintained unless notice of intention to sue shall have been filed with the comptroller of the city within six months after the cause of action shall have accrued. Held, that where a claim for injuries to property by the breaking of a water pipe was duly served and filed, and complied with the statute in every respect, except that it did not in terms state that plaintiffs intended to sue, and after receiving it the comptroller numbered it and gave plaintiffs notice to appear and be examined touching the merits thereof, it constituted a substantial compliance with the statute, and was sufficient to sustain an action against the city, 141 N. Y. S. 372.

#### Contracts—Rights of Material Men.

*Lombard Governor Co. et al. v. Mayor and City Council of Baltimore, et al.*—An ordinance of Baltimore required that all contracts made by the city contain a clause requiring the contractor on tendering delivery of completed buildings, etc., to produce vouchers showing settlement in full with all persons having furnished labor and materials for the construction thereof. A sanitary contract required the contractor to furnish the commission with satisfactory evidence that all persons who had done work or furnished materials under the contract, and had given written notice thereof, had been fully paid, or satisfactorily secured, and, in case such evidence was not furnished, the amount necessary to meet such claims should be retained from the moneys due the contractor until the liabilities had been fully discharged, or notice withdrawn. Held, that neither the ordinance nor the contract provision entitled materialmen to maintain an equity suit in the nature of a garnishment against the city to have a balance due the contractor impounded and applied to their claims on the theory that it constituted a trust fund for their benefit.—Court of Appeals of Maryland, 88 A. R. 140.

## NEWS OF THE SOCIETIES

### Calendar of Meetings.

November 6-7.  
GREAT LAKES INTERNATIONAL PURE WATER ASSOCIATION.—Meeting, Toronto, Canada. Paul Hansen, Secretary, Urbana, Ill.

November 10-15.  
UNITED STATES GOOD ROADS ASSOCIATION.—Meeting St. Louis, Mo. John H. Bankhead, president; J. A. Rountre, secretary, 1021 Brown-Marx Building, Birmingham, Ala.

November 20-22.  
ALABAMA GOOD ROADS ASSOCIATION.—Annual meeting, Mobile, Ala. J. A. Rountree, Secretary.

December 1-2.  
AMERICAN SOCIETY OF REFRIGERATING ENGINEERS.—Annual meeting, New York City. W. H. Reed, Secretary, 154 Nassau St., New York City.

December 2-5.  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Annual meeting, New York City. Calvin W. Rice, Secretary, 29 W. 39th St., New York City.

December 8-11.  
ASSOCIATION OF AMERICAN PORTLAND CEMENT MANUFACTURERS.—Annual meeting, New York City. Percy H. Wilson, Secretary, Land Title Building, Philadelphia, Pa.

December 9-12.  
AMERICAN ROAD BUILDERS' ASSOCIATION.—Annual Convention, First Regiment Armory, Philadelphia, Pa. E. L. Powers, Secretary, 150 Nassau street, New York City.

December 10-13.  
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS.—Annual meeting, New York. J. C. Olsen, Secretary, Polytechnic Institute, Brooklyn, N. Y.

### National Municipal League.

The nineteenth annual meeting of the National Municipal League and the twenty-first national conference for good city government will be held in Toronto, November 11-15. The day sessions will be held in the Council Chamber in the City Hall. The headquarters will be at the King Edward Hotel. The noonday luncheons will be held at McConkey's restaurant, near the City Hall. Registration will be at the City Hall. Preceding the formal sessions on Wednesday evening will be numerous committee meetings. The program is as follows:

Wednesday, November 12th

8 P. M.—First formal meeting in Convocation Hall, University of Toronto. Lieutenant Governor of the Province of Ontario, Sir John M. Gibson, presiding. There will be brief welcoming addresses by His Worship, H. C. Hocken, Mayor of Toronto, Sir James P. Whitney, Premier of the Province, President Falconer, of the University of Toronto. The reply on behalf of the National Municipal League will be made by Camillus G. Kidder, Esq., Orange, N. J., vice-president.

The annual review of the secretary, Clinton Rogers Woodruff, Philadelphia, will deal with the question "Of What Does Municipal Advance Consist?"

The annual address of the president, "Public Opinion," Hon. William Dudley Foulke, Richmond, Ind.

Thursday, November 13th

10 A. M.—Annual business meeting of the National Municipal League, President Foulke in the chair. Report of the Executive Committee, M. N. Baker, Montclair, N. J., chairman.

Report of the treasurer, George Burnham, Jr., Philadelphia, Pa. Report of the Nominating Committee. Report of Committee on Municipal Budgets, George Burnham, Jr., Philadelphia, chairman. Report of the Committee on Municipal Reference Libraries, Dr. Horace E. Flack, chairman, Municipal Reference Librarian, Baltimore. Other committee reports; "Sane Scheme of Civic Education," Miss Louis Connolly, Newark, N. J. "Civic Education"—Report of the Special Committee, by the chairman, Arthur W. Dunn. Round table luncheon will be held at 1 p. m., over which Mr. Dunn will preside. The general subject will be "Civic Education."

3 P. M.—Camillus G. Kidder, vice-president, in the chair. "The Status of Liquor License Legislation," John Koren, Boston.

The Coming Of The City Manager Plan—Report of the Special Committee on Commission Form to Government, Richard S. Childs, Chairman. The discussion will be opened by Dr. Ernest S. Bradford, of Washington D. C., by S. M. Worthington, of Sumter, S. C., and by A. E. Adams, of Youngstown, Ohio.

8 P. M.—Civic reception to the members and delegates to the National Municipal League by the City Council and other prominent citizens. This will be held in the Archaeological Department of the University of Toronto.

Friday November 14th.

10 A. M.—Hon. William Dudley Foulke in the Chair.—The Model Municipal Court: Herbert Harley, Esq., Chicago, Secretary of the American Judicature Society.

Proportional Representation, Preferential Voting and Direct Primaries:—The leading paper will be by Prof. C. G. Hoag, Secretary of the American Proportional Representation League, who will also conduct an election under the proportional representation plan as advocated by him. The discussion will be opened by Prof. Lewis J. Johnson, of Harvard University, and the Hon. George B. Burd, of Buffalo, N. Y. At the Round Table Luncheon at 1.15 P.M. the Question to be discussed will be "How can a small group of high-minded and trusted citizens most effectively influence the voters of a city concentrating their votes when there are a great many candidates for any one office?" Robert S. Binkerd, Secretary of the City Club of New York, will be the presiding officer.

3 P. M.—William D. Foulke, President, in the Chair. Canadian Session. Ontario Municipal Methods: By Hon. W. J. Hanna, Provincial Secretary. Ontario's Publicity Owned Hydro-Electric System: By Hon. Adam Beck, Chairman The Ontario Hydro-Electric Commission. Economic Housing in Toronto: By G. Frank Beer, President of the Toronto Housing Co., Limited. St. Lawrence River and Great Lakes

—Harbors and Navigation: By F. S. Spence, member of the Board of Harbor Commissioners, Toronto.

Friday, November 14th

7 P. M.—Dinner to the members and delegates at King Edward Hotel.

Saturday, November 15th

10 A. M.—Scientific Management of the Public Works of Cities: Winston Paul, Secretary of the Citizens' Federation of Hudson County, opening the discussion. The Actual Operation of the Oregon System: By Richard W. Montague, Portland, Ore. State or Municipal Control of Public Utilities: Report of the Committee on Franchises, Dr. Delos F. Wilcox, New York, Chairman.

### American Road Builders' Association.

The tenth annual convention will be held in the First Regiment Armory, Broad and Callowhill streets, Philadelphia, Pa., December 9-12.

The program will include a paper and discussion in each of the following topics:

Subject A.—Organization.

1. Highway Officials, Their Duties and Powers.
2. Division of Expense, Responsibility and Authority Between Nation, State, County and Town.
3. The Relation to Each Other of the Contractor, Engineer and Inspector.
4. Details of Arrangements for the Use of Convict Labor.

Subject B.—Construction.

1. Determination of the Amount of Realignment, Grading and Drainage to Be Done in Connection with Road Improvement.

2. Factors Governing a Proper Selection of Road or Street Pavement.

3. Details of the Construction of the Various Kinds of Roads and Pavements.

Ten minute papers on the following subjects:

Earth Roads, Sand-Clay Roads; Gravel Roads; Water Bound Macadam, Bituminous Macadam and Bituminous Concrete, Brick, Concrete, Wood, Granite and Asphalt Block, Sheet Asphalt.

4. Unit Price and Lump Sum Contracts and Percentage Work.

5. The Testing of Material for Road and Street Construction.

Subject C.—Maintenance.

1. Sub-Organization for Securing Efficient Maintenance.

2. General Methods of Repairs and Renewals.

3. Bituminous Surface Treatment and Dust Prevention.

Among those who are to take part in the proceedings, either by reading papers or in discussions following the presentation of papers, are the following: Chas. J. Bennett, State Highway Commissioner of Connecticut; E. M. Bigelow, State Highway Commissioner of Pennsylvania; A. H. Blanchard, Professor of Highway Engineering, Columbia University, New York, N. Y.; Henry L. Bowlby, State Highway Engineer of Oregon; Frank W. Buffum, State Highway Commissioner of Missouri; John N. Carlisle, State Highway



Commissioner of New York; Wm. H. Connell, Chief, Bureau of Highways and Street Cleaning, Philadelphia, Pa.; Geo. W. Cooley, State Engineer of Minnesota; F. L. Cranford, Road Contractor, Brooklyn, N. Y.; Major W. W. Crosby, Chief Engineer, Maryland Geological Survey; A. W. Dean, Chief Engineer, Massachusetts Highway Commission; Fred. E. Ellis, Road Contractor, Peabody, Mass.; A. B. Fletcher, State Highway Engineer of California; S. D. Foster, Chief Engineer, Pennsylvania State Highway Department; R. B. Gage, Chemist, State Highway Department of New Jersey; John S. Gillespie, Road Commissioner of Allegheny County, Pa.; L. R. Grabill, Superintendent of Suburban Roads, District of Columbia; H. C. Hill, Engineer; Lane Construction Co., Meriden, Conn.; A. R. Hirst, State Highway Engineer of Wisconsin; Prevost Hubbard, Consulting Chemist, Institute of Industrial Research, Washington, D. C.; Jos. W. Hunter, Deputy Commissioner, Bureau of Township Highways, Pennsylvania State Highway Department; A. N. Johnson, State Highway Engineer of Illinois; C. A. Kenyon, President, Indiana Good Roads Association; Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment, New York, N. Y.; James H. MacDonald, former State Highway Commissioner of Connecticut; T. H. MacDonald, State Highway Engineer of Iowa; W. A. McLean, Chief Engineer of Highways and Commissioner of the Ontario Public Roads and Highways Commission, Toronto, Ont., Canada; R. A. Meeker, State Highway Engineer of New Jersey; Harold Parker, Vice President, Hassam Paving Co., Worcester, Mass.; Robert J. Potts, Professor of Highway Engineering, Agricultural and Mechanical College of Texas, College Station, Tex.; Dr. Joseph Hyde Pratt, State Geologist of North Carolina; Jean de Puligny, Engineer-in-Chief, Board of Public Works of France, and Director of the French Mission of Engineers to the United States; John J. Ryan, Secretary Road Builders' Association, Albany, N. Y.; Frank F. Rogers, State Highway Commissioner of Michigan; Chas. W. Ross, Street Commissioner, Newton, Mass.; Paul D. Sargent, Chief Engineer, Maine State Highway Commission; Herman H. Schmidt, Chief Engineer, Bureau of Highways, Borough of Brooklyn, New York, N. Y.; Henry G. Shirley, Chief Engineer, Maryland State Roads Commission; Francis P. Smith, Consulting Chemist and Paving Engineer, New York, N. Y.; Robert C. Terrell, Commissioner of Public Roads of Kentucky; Geo. W. Tillson, Consulting Engineer to the President of the Borough of Brooklyn, New York, N. Y.; Wm. D. Uhler, Assistant Engineer Bureau of Highways and Street Cleaning, Philadelphia, Pa.; P. St. J. Wilson, State Highway Commissioner of Virginia.

#### United States Good Roads Association.

The program for the convention and exposition to be held in St. Louis, Mo., November 10-15, is as follows:

Governors' Day, Monday, 10th.—Invitations to all Governors, their families and their staffs. Welcome, Governor E. W. Major, of Missouri. Response, J. H. Bankhead, President U. S. Good Roads Association. Informal reception, 8 p. m., Planters' Hotel.

Mayors' Day, Tuesday, 11th.—Invitations to all mayors, their families and their staffs. Welcome, Mayor Henry W. Kiel, of St. Louis. Response, Col. D. W. Potter, Vice-President U. S. Good Roads Association. Informal reception, 8 p. m., Planters' Hotel.

Legislative Day, Wednesday, 12th.—Invitations to all Legislators, National, State and Municipal, and their families, extended by the Missouri Congressional Delegation and the Missouri Legislators. Welcome, J. J. Russell, M. C. Response, John W. O'Neill, Vice-President U. S. Good Roads Association. Informal reception, 8 p. m., Planters' Hotel.

Farmers' Day, Thursday, 13th.—Welcome, Thomas C. Wilson, Missouri State Board of Agriculture. Response, E. J. Watson, Vice-President U. S. Good Roads Association, Informal reception, 8 p. m., Planters' Hotel.

State Officers' Day, Friday, 14th.—Welcome, W. R. Painter, Lieutenant Governor of Missouri. Address by Cornelius Roach, Secretary of State, John P. Gordon, Auditor; Edwin P. Deal, Treasurer. Response, Thomas T. Fauntleroy. Informal reception, 8 p. m., Planters' Hotel.

Press and Education Day, Saturday, 15th.—Welcome, Howard A. Glass, Editor State Schol Journal. Address, E. C. Erwin, President Press Club of St. Louis. Response, Capt. Robert E. Lee. Informal reception, Planters' Hotel, 8 p. m.

The following speakers and their subjects have been chosen, dates and hours to be arranged at a later date. No long paper, but general short, crisp debates will be the feature of the Convention. It will be practical and not theoretical. Less rhetoric and better results is the object of the meeting. Dr. H. J. Waters, President Kansas Agricultural College, Manhattan, selected as orator for the National Grange; subject: "The Granger a Road Builder." J. A. Everett, President Farmers' Equity Society, Indianapolis; subject—(to be supplied). Thomas T. Fauntleroy, Missouri Director, Director U. S. Good Roads Association; subject, "Road Building an Investment." Jesse Taylor, editor "Better Roads," Jamestown, O.; subject, "Get Together and See the Mud Disappear." Dr. J. W. Muir, La Grange, Mo., chosen speaker of Missouri State Grange; subject: "Our Grange and Good Roads." John Craft, President Alabama Good Roads Association, Mobile; subject: "Progress of Road Building in the South." Rev. S. M. Johnston, Roswell, N. M.; subject, "The Roads the Government Should Build." James P. Phillips, Ewing, Mo., subject: "The Farmer and Improved Highways." G. A. Nelson, New Decatur, Ala.; subject: "Report on International Good Roads Congress, held in London, England." P. H. Cullen, St.

Louis, Mo.; subject: "Why We Will Build Better Roads." J. A. Rountree, Birmingham, Ala., Secretary United States Good Roads Association; subject: "The Organization of the United States Good Roads Association." P. P. Lewis, President Missouri State Board of Agriculture, Crescent, Mo.; subject: "Better Roads and Better Crops." Judge J. M. Lowe, President The National Old Trails Road Association, Kansas City; subject: "National Roads vs. National Aid."

#### American Society of Mechanical Engineers.

At the regular meeting of the society, 29 West 39th street, New York City, Tuesday, November 11, at 8.15 p. m., C. V. Kerr, sales engineer of the A. S. Cameron Steam Pump Works, will present a paper describing a new centrifugal pump with helical impeller. The reason for seeking a new type of pump is based on the characteristic behavior of the small steam turbine which is commonly used in power plants as the driving power for circulating pumps for condensers.

#### New England Water Works Association.

The November meeting will be held at Hotel Brunswick, Copley Square, Boston, Wednesday, November 12, 1913. The following papers will be presented: "Cleaning Water Mains in Hartford, Conn.," Caleb Mills Saville, Chief Engineer, Board of Water Commissioners, Hartford, Conn.; "Water and Life," by Lawrence J. Henderson, M. D., Professor of Biological Chemistry, Harvard University. Topical discussion: "Advisability of Securing Legislation for Making Water Bills a Lien Upon Property Supplied."

#### League of California Municipalities.

A resolution favoring a commission form of government for the state of California was adopted October 10 by delegates to the convention. The resolution provided for the appointment of a committee to report next year upon the advisability of amending the state constitution so that the commonwealth would be governed by a small body of trained legislators continuously in session and with the power to enact laws, subject to veto. The "inefficiency of the present methods of the state legislature is strikingly manifest," the resolution states, "whereas under the initiative and referendum the full power of government is safeguarded."

Officers for the coming year were elected as follows:

Percy V. Long, city attorney of San Francisco, president; A. E. Snow, mayor of Fresno, first vice-president; Allen H. Wright, city clerk of San Diego, second vice-president; H. A. Mason, tax expert of San Francisco, who resides at Mountain View, secretary. The assistant secretaryship, an appointive office, was filled by Mr. Mason, who, after his own election, named W. F. Locke, city clerk of Alameda to that office.



**Virginia Public Health Association.**

The fourth annual session was held in the City Auditorium, Lynchburg, Va., October 23.

The president of the association is Dr. P. S. Schenck, of Norfolk; vice-presidents, Dr. O. C. Eright, of Jarratt, and Dr. E. F. Reese, of Courtland; secretaries-treasurers, Dr. Lucien Lofton and Dr. W. F. Driver, of New Market. The executive committee is made up of a representative of each congressional district.

The following program was carried out:

Opening Session—Report of executive committee; election of new members; report of secretary-treasurer; special reports.

Address of the president, Dr. P. S. Schenck, of Norfolk.

Address of invited guests, Dr. W. A. Evans, of Chicago.

Second Session—"Importance of Tuberculosis Testing of Dairy Cows," F. I. Winan, invited guest, Bureau of Animal Industry, Washington, D. C.

"Milk Supervision in Lynchburg," Mr. Leo J. Faulkner, Lynchburg.

"Practical Hints for Local Health Officers, in Relation to Food and Dairy Supplies," Dr. R. L. Robertson, Charlottesville.

"Tuberculosis Work in Lynchburg," Miss Bessie Fleming, Lynchburg.

The following papers will be given:

"The Mosquito in Politics," Dr. S. W. Dickinson, Macon.

"The Autobiography of a House Fly," Dr. C. T. Bowyer, Stonega.

"The Campaign Against Hook Worm Disease in Virginia," Dr. Allen W. Freeman, Richmond.

"Prophylaxis in Regard to Heat and Light," Dr. F. M. Horsley, Livingston.

"Malaria," Dr. F. H. Hancock, Norfolk.

"Racial and Social Evils of Degeneracy" (illustrated), Mr. Alexander Johnson, Vineland, N. J.

"Pointers in Correct Registration of Deaths and Births," Dr. W. A. Plecker, Richmond.

"The Pollution of Streams," Dr. Mosby G. Perrow, Lynchburg.

Paper (subject not announced), Dr. W. B. Foster, Roanoke.

"Fighting the House Fly," Dr. E. C. Levy, Richmond.

At the conclusion of the program the next meeting place will be decided upon, officers will be elected, and other routine business will be transacted.

**Southern Appalachian Good Roads Association.**

The fifth annual convention was held in Asheville, October 22-23.

The first session was featured by addresses of welcome and responses and speeches by Governor Locke Craig of North Carolina, and President W. W. Finley of the Southern Railway Company. At the afternoon session, the attendants upon the convention heard reports of the progress being made in road development by the states holding membership in the or-

ganization: North Carolina, South Carolina, Virginia, Georgia, West Virginia, Tennessee, Alabama and Kentucky.

President Finley spoke of the "Relation of the State to Highway Improvement." He favored the organization of state highway commissions to supervise work, but thought they should not, in managing construction, supplant good county organizations already existing.

C. B. Scott, member Virginia Highway Commission, said that prospects in Virginia for road work were very bright in the future.

C. D. Williams, chief road engineer, West Virginia, believed that the Federal government should aid in building post roads and should build roads connecting state capitals.

J. A. Smith, chairman of the highway commission, Hall county, Georgia, said that in his county macadam had been abandoned for sand-clay.

Bristow, Tenn., was chosen as the place for the 1914 meeting. Dr. Joseph Hyde Pratt, of Chapel Hill, was re-elected president and treasurer of the organization, and H. B. Varner, of Lexington, succeeds himself as secretary.

**Ocean to Ocean Highway Association.**

With the election of officers and the selection of next year's meeting place, the third annual convention of the ocean-to-ocean highway association was brought to a close at Los Angeles, October 25.

Colonel D. K. B. Sellers, mayor of Albuquerque, N. M., was chosen president. Fred T. Colter, Springerville, Ariz., first vice president; J. Y. Aragon, Magdalena, N. M., second vice president; C. O. Baker, Banning, Cal., third vice president; John Becker, Jr., Belen, N. M., secretary; Frank McKee, Albuquerque, N. M., treasurer.

Executive committee: For Arizona—B. T. Petterson, J. A. Ketcheside, G. Becker; for New Mexico, James A. French, W. M. Borrowdale, H. M. Dougherty; for California, John S. Mitchell, Carl S. Carlton, F. W. Balfour.

Legislative committee: For Arizona—H. A. Stone, F. E. Elliott, George W. Peabody, J. J. Keegan, Fred T. Colter; for New Mexico, Colonel Sellers, John Becker, Jr., H. O. Bursom, James A. French, J. S. Mactavish; for California, P. G. Cogswell, M. P. Chubb, Russ Avery, W. A. Freemire and W. R. Clancey. It was decided to hold the next tri-state convention in Yuma, Ariz., next year and the 1915 convention in Springerville.

**Southwestern Waterworks Association.**

At a meeting of the executive committee at Dallas, on the invitation of Mayor Frank Wovden, it was decided to hold the 1914 convention in Tulsa, May 18-20. The new municipal convention hall will be completed by that time and will afford unusual facilities to exhibitors, for which no charge will be made. Luke Ballard, superintendent Tulsa waterworks, is chairman of the exhibit committee.

**Kansas Gas, Water, Electric Light and Street Railway Association.**

At the recent convention at Hutchinson the following officers were elected: President—A. L. Newnan, Arkansas City.

Vice-Presidents—H. W. Magruder, Liberal; L. K. Greene, Concordia, and H. S. Sladen, Wichita.

Secretary-Treasurer—Ivor Thomas, of Wichita, re-elected.

Executive Committee—L. U. Ripley, Wichita; A. M. Patton, Topeka; W. E. McFadden, Salina; W. A. Scothorn, Hutchinson, and J. F. Vail, Manhattan.

**Orange Board of Trade.**

There has been organized in the city of Orange, N. J., a Board of Trade which has for its object the civic and social uplift and the industrial betterment of the city. The officers are: John D. Everitt, president; John C. Conover, vice-president; J. A. Neill, secretary; Miles A. Hanchett, secretary; directors: Edward S. Perry, Jacob Roth, Guy Decker, Charles Starr, Henry F. Schmitt, Thomas A. Davis, George E. Spottiswoode, Joseph D. Holmes and John Farrell.

**PERSONALS**

Allison, M. M., has been elected mayor of Riverview, Tenn.

Beecher, Edward, Lestershire, N. Y., has been appointed an inspector of highway by State Highway Commissioner John M. Carlisle.

Burger, W. K., Belmar, N. J., has been elected Chief of Fire Department, and V. J. Haunsotte Assistant Chief.

Davidson, James L., Quincy, Fla., has been elected Mayor.

Dedman, Joseph N., has been re-elected mayor of Columbia, Tenn.

Garretson, Cornelius D., Wilmington, Del., has been appointed member of the Board of Utility Commissioners to succeed Samuel G. Cleaver, resigned.

Hart, John J., Pittston, Pa., has resigned his position as Fire Chief.

Hazen, Allen, Richard L. Humphreys and Frederic W. Taylor, have been appointed commissioners to examine the concrete sea walls at League Island Park, Philadelphia.

Jones, Jonathan, Philadelphia, Pa., has been appointed assistant engineer in charge of bridge construction at a salary of \$4,000 by Director Cooke.

Lynch, Dan W., Fruita, Colo., has been appointed Mayor by the Council to succeed A. J. Lee, resigned.

Polloch, Clarence, New York, N. Y., recently engineer in charge of paving, Havana, Cuba, has been appointed paving engineer for San Antonio, Tex., where a large amount of work will be done during the next few years.

Scudder, Everett E., New York City, assistant engineer Board of Water Supply, died October 12.

Wood, Mac, J. A. Russell and John Gardner, La Grange, Ore., have been elected commissioners in its first municipal election. One of the first duties of the Council will be to select a city manager.

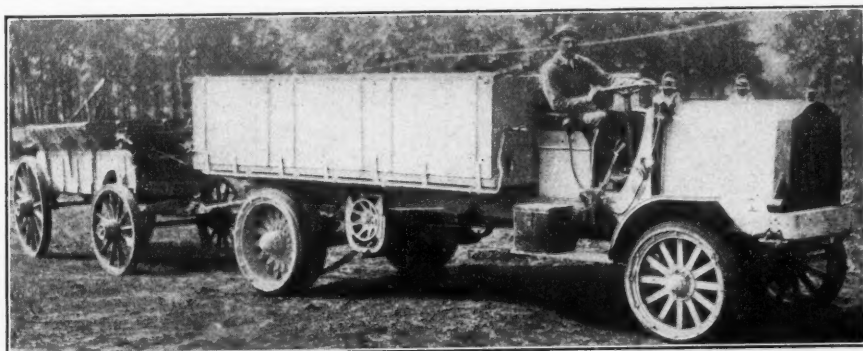
# NEW APPLIANCES

## 3-TON TRUCK.

### Good Performance of Packard in Hauling Contractors' Materials in Bridgeport.

The excellent record of a three-ton Packard motor truck in hauling crushed stone and other contractors' supplies in the vicinity of Bridgeport, Conn., is worth noting. The truck was purchased by Frank B. Paine, a general hauling contractor, February 9, 1912. The truck was not new at this time, but had been in use as a manufacturer's demonstration car for nearly a year.

Up to September, 1913, the truck had completed 51,000 miles of service.



PACKARD THREE-TON TRUCK AND TRAILER.

It has not missed a trip since it went into service, and the driving chains have been renewed only once. The only renewed parts that have been made were two sets of platinum points for the magneto, six extra spark plugs and four valve tappets. After the truck had been run 50,000 miles, Mr. Paine put on new driving sprockets and overhauled the radius rods. The average load of the Packard three-ton unit for the first 40,000 miles was 8,500 pounds, this performance having been made entirely over ordinary country roads.

At the present time, this Packard three-ton unit is averaging 60 miles per day, and working as a team mate with a Packard five-ton unit on a forty-thousand ton contract, delivering trap rock to the new Stadium, now being constructed at Yale University. At times, the three-ton unit also pulls a three-ton trailer.

The company having the contract for the building of the new Stadium desired to engage Mr. Paine and his truck, and to also take charge of a five-ton worm-driven truck which they were about to purchase. Mr. Paine, however, was so enthusiastic about the Packard that the contractors for the Stadium agreed to purchase a five-ton Packard. They placed the five-ton Packard unit with Mr. Paine, and are now paying him a certain percentage of this truck's earnings each

week, retaining the balance of the machine's earnings, which are applied in payment of the five-ton Packard unit. The five-ton Packard will become Mr. Paine's property in due season. Mr. Paine on his part agrees to deliver with his three-ton Packard, and his new five-ton unit, 150 tons of trap rock per day at the Stadium site. The building contractors also furnish Mr. Paine trailers for both trucks. The trailers, however, have been used very little, as Mr. Paine delivers an average of about 130 tons per day with the two Packard units.

In good weather, Mr. Paine uses trailers on his trucks, and delivers from 150 to 180 tons at the Stadium

## MOTOR TRUCKS.

### Locomobile Company Makes Dumping Truck with Special Body to Retain Heat of Asphalt Mixture.

This summer the Locomobile Company has been conducting a series of experiments to develop a body which would retain the heat of asphalt mixture sufficiently to enable the truck to serve a larger territory, and as a result they have adopted as their standard for asphalt bodies a dumping body in which the asphalt can be safely carried from 15 to 20 miles. The Locomobile Company have furnished us with figures showing cost of operating two trucks during the month of August by their owners, the Union Paving Company, of Philadelphia. Although they leave out any figures relating to savings effected through concentration of plant, and carry no credits for business, which because of its distance could not have been handled except by this means, the report brings out interesting facts. They show that Locomobile truck No. 1, which carried 704 tons of asphalt and ran 1,294 miles during the month of August, gave net earnings of 43 cents per mile, a total of \$566.42 for the month. Locomobile truck No. 2, which carried 754 tons and ran 1,328 miles, earned 41 cents a mile net, a total of \$544.48 for the month.

Net earnings are arrived at by crediting the truck with \$5.50 per day for each team which it replaced, and by dividing the total by the mileage after the total operating costs have been deducted. These operating costs not



LOCOMOBILE FIVE-TON TRUCK WITH BODY FOR ASPHALT.



only cover tires, gasoline, driver, garage, etc., but they also include interest, depreciation, insurance and an allowance for future overhauling charges.

Partial figures for each truck are as follows:

Locomobile Truck No. 1.	
No. of days worked.....	23
No. of miles run.....	1,294
No. of tons carried.....	704
Gasoline .....	\$76.96
Oil .....	3.57
Grease .....	3.92
Driver .....	82.97

\$167.24

Net earnings per mile.....\$0.43

Locomobile No. 2.	
No. of days worked.....	23
No. of miles run.....	1,328
No. of tons carried.....	754
Gasoline .....	87.29
Oil .....	4.27
Grease .....	3.64
Driver .....	72.89

\$168.09

Net earnings per mile.....\$0.41

## INDUSTRIAL NEWS

**Cast Iron Pipe.** Birmingham. Prices are reported as firmer. Plants as a rule are working on short time with yards well filled with accumulations. Many small orders, however, have been received. Quotations: 4-inch, \$22; 6-inch and up, \$20. New York. Municipal lettings in sight are few and unimportant. Quotations: 6-inch, car loads, \$23 to \$23.50.

**Lead.** A good volume of business is being transacted. Quotations: New York, 4.35c.; St. Louis, 4.20c.

**Asphalt Specifications.**—The consulting board of the New York State Highway Commission has rendered its decision reporting that it had decided to retain separate specifications for the natural and for the oil asphalts. The reason given was that the selection of either of these products on any particular road was to be left to the highway commissioner, difference in climatic conditions in various parts of the state making it desirable, in the opinion of the board, to give the commission the option of selecting the material most suited under particular conditions.

**Publicity Work of Water Company.**—The Terre Haute Water Works Company, Terre Haute, Ind., recently published a half page advertisement in the "Booster Section" of the Terre Haute Sunday Star. Across the top of the page is a good reproduction of a view of the water company's grounds, a well cared for park-like piece of property with buildings covered with vines in the background. The text states that the public is welcome to the use of the grounds and that the tennis court can be reserved by telephone. A few words are added about the high quality of the filtered water supplied and the desire of the company to please the public.

**Decarie Incinerator.**—The Decarie Incinerator Co., Minneapolis, Minn., publish a booklet giving illustrations and brief descriptions of a number of their plants for the disposal of garbage and refuse. The plants illustrated are those at Virginia, Minn., Minneapolis, Minn., Spokane, Wash., Rochester, N. Y., Wheeling, W. Va., Richmond, Va., Norfolk, Va., East Liverpool, O., North Braddock, Pa., Portsmouth, Va., and Lynchburg, Va. The company also publishes a booklet under the caption "The Mayor Has an Interview with an Expert" which reviews the garbage disposal question in a way that brings out the chief points of the problem very clearly. By a series of questions and answers general principles are disposed of first and details of methods explained later.

**Lighting Standards.**—J. W. Bache & Company, 50 Church street, New York City, has been organized to handle the products of the Morris Iron & Steel Company, Frederick, Md., in the Eastern states, as well as the entire export business. J. W. Bache and H. S. Corey are the partners.

**Fire Hose.**—Julius Pearse Fire Department Supply Company, 304 Jacobson Building, Denver, Colo., announce that D. L. Cubberly has been made vice-president and will devote his time to the Eureka fire hose line. The company also handles the business of the Seagrave Company and the Gamewell Fire Alarm Telegraph Co. in their district.

**Concrete Structures.**—The bulletin of the Lehigh Portland Cement Co., Allentown, Pa., for September contains illustrations of a number of concrete structures where Lehigh cement was used as follows: Concrete bridge built by the Currvensville Construction Co., Tyrone, Blair Co., Pa.; A. M. Bloom was the engineer in charge and H. G. Hinkle, county engineer. Concrete road, Hanover township, Pa.; Harrison & Butts, Wilkes-Barre, Pa., engineers; M. J. Malloy, Sugar Notch, Pa., contractor. Also cuts of Grand River road, Wayne County, Mich., and a concrete roadway on Lewis drive, Waterbury, Conn.

**Road Oil.**—The Indian Refining Company, New York, which has a refinery at Georgetown, Ky., is establishing an oil storage plant in Louisville.

**Expansion-Joint Material.**—Robert L. Beck, The Arcade, Cleveland, O., make the B. & B. Expansion Strip which is being used extensively in paving work in Cleveland and vicinity. The strip is made of an elastic composition and is for use in all kinds of paving. It is manufactured in four-foot lengths and of any required thickness.

**Valuation.**—Henry E. Elrod, of Dallas, Tex., and Lamar Lyndon, New York City, have been employed by the city of Houston to find the real value of the property of the Houston Light and Power Company and the cost of operating and maintaining the same. They will receive \$5,000 for the work. The services of Messrs. Elrod and Lyndon were engaged because the Mayor and City Commissioners said the answers given to the questions recently asked the Houston Lighting and Power Company by Mayor Campbell in regard to the expenses, value and profit of that company contained many technical terms they could not understand. The Mayor and Commissioners say they are having to pay too much for light and power furnished the city by the corporation and they want to find the real value of the lighting and power corporation, their expenses and receipts, in order that they may form an intelligent opinion as to what reductions should be made.

**Atlas-Diesel Engine Test.**—The Lyons-Atlas Company, Indianapolis, Ind., recently made a series of tests of a 450 h. p. Atlas-Diesel engine which was to be supplied to L. L. & P. U. Nunn, Provo, Utah. A tabular statement of the results of the test is given below. It will be noted that the greatest efficiency was at the full load capacity; at this time, 0.427 lb. of oil, 30° Baume, was consumed. The overload possibilities of the engine are most interesting from the standpoint of the manager of an electric light plant. It will be noted that as much as 525 h. p. was developed at one time and at the same time the efficiency was good.

	Hours Each Test.						
	2	1	3	2	4	1	1
Approximate per cent of rating .....	25%	33%	50%	75%	100%	110%	115%
Net brake-h.p. load .....	131	165	247	355	459	498	525
Total oil per hour, lb. ....	92	110	121	154	196	218	225
Oil per brake-h.p.-hr., lb. ....	.703	.667	.49	.433	.427	.44	.43
Oil per indicated-h.p.-hr., lb. ....	.316	.334	.30	.300	.318	.332	.33
Mean effective pressure for each cylinder, lb. per sq. in. ....							
Cylinder 1 .....	40	45	55	72	84	93	96
Cylinder 2 .....	41	47	56	73	87	91	97.5
Cylinder 3 .....	40	45	58	73	90	95	97
Average mean effective pressure, lb. ....	40.3	45.7	56.3	72.7	87	93	96.8
Indicated h. p. ....	291	329	403	518	615	656	682.4
Mechanical efficiency, per cent. ....	45	50	67.5	68.5	74.6	76	77
Friction and compressor losses .....	160	164	156	163	156	158	157.4
Revolution per minute .....	184	183	182	181.5	180	179	179
Gal. oil per 100 brake-h.p.-hrs. ....	9.63	9.1	6.72	5.93	5.85	6.03	6.00
Net thermal efficiency, per cent. ....	18.9	19.9	27.1	30.7	31.1	30.2	30.9



# ADVANCE CONTRACT NEWS

## ADVANCED INFORMATION BIDS ASKED FOR

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

## CONTRACTS AWARDED ITEMIZED PRICES

### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS</b>				
Ill.	Pekin	Nov. 8	1,816 sq. yds. brick paving; 650 ft. concrete curb and gutter	J. R. Seibert, City Engr.
O.	Grafton	1 p.m., Nov. 10	Grading streets	J. B. Croessen, Clk. Trus.
Mo.	Clayton	5 p.m., Nov. 10	Furnishing macadam and gravel	Wm. Eldring, Hwy. Engr.
Pa.	Erie	Nov. 10	Constructing sidewalks	City Clk.
Ind.	Marion	10 a.m., Nov. 10	Road repairs	W. T. Patton, Co. Aud.
Ind.	South Bend	Nov. 10	Grading, draining and paving	C. Sedgwick, Co. Aud.
O.	East View	noon, Nov. 10	2 1/2-inch stone slag sidewalks	A. A. Smith, VII. Clk.
Mont.	Hamilton	Nov. 10	Road construction	Bd. Co. Comrs.
La.	New Orleans	noon, Nov. 10	Main road about 9 miles long	W. E. Atkinson, State H. E.
Ind.	Fort Wayne	10 a.m., Nov. 10	Road improvement	C. H. Brown, Co. Aud.
Ind.	Indianapolis	10 a.m., Nov. 10	Road repairs	W. T. Patten, Co. Aud.
Mont.	Hamilton	10 a.m., Nov. 10	40,000 ft. of road	Al. J. Hork, Clk. Bd. Co. Comrs
Ariz.	Tucson	Nov. 10	Tucson Bisbee Highway	B. L. Hitch, Clk. Bd. Superv.
Ind.	Shelbyville	10 a.m., Nov. 10	Road	C. Sedgwick, Co. Aud.
Ind.	Butler	Nov. 10	Paving 20,700 sq. yds.	C. L. Buehner, City Clk.
Cal.	Los Angeles	Nov. 10	Improving streets	H. J. Leland, Clk.
Ill.	Evanston	Nov. 10	Asphaltic concrete, 25,000 yds.	J. H. Moore, City Engr.
O.	Canton	noon, Nov. 11	Paving	R. F. Harbert, Dir. P. S.
N. Y.	N. Brighton, S. I.	noon, Nov. 11	Grading sidewalks	Geo. Cromwell, Pres. Boro.
Wis.	Madison	2 p.m., Nov. 12	Paving and improvements	Bd. Pub. Wks.
N. Y.	White Plains	Nov. 12	Relaying sidewalks	City Engr.
Minn.	Duluth	Nov. 12	11 miles earth road	F. F. Rogers, St. Hwy. Comr.
Mich.	St. Joseph	10 a.m., Nov. 12	Grading 26 miles	Bd. Road Comrs.
N. Y.	Brooklyn	11 a.m., Nov. 12	Street improvements	L. H. Pounds, Boro. Pres.
Ind.	LaPorte	Nov. 12	Roads	Comrs. Berrien Co.
La.	Shreveport	Nov. 13	Gravel, 2 1/2 miles	J. T. Bullen, Engr.
La.	Lake Charles	Nov. 13	Paving of Kirby and Division Sts.	City Comm.
Ga.	Savannah	noon, Nov. 13	Furnishing 3,000 cu. yds. cement gravel	G. R. Butler, Clk.
Mont.	Dillon	10 a.m., Nov. 14	50,072 ft. of wagon road	J. S. Baker, Clk.
O.	Cincinnati	noon, Nov. 14	Concrete gutter	F. E. Wesselman, Pr. Bd. Comrs.
Mich.	Sanford	noon, Nov. 15	Grading and surfacing 3 miles highway	W. H. Allswede, Clk. of Jerome Twp.
Ind.	Richmond	11 a.m., Nov. 15	Improvement of highways	L. S. Bowman, Co. Aud.
Mich.	Lansing	Nov. 15	11 miles of earth road	F. F. Rogers, State Hwy Comr.
Minn.	St. Paul	noon, Nov. 15	Clearing and grubbing	St. Hwy. Comr.
Ala.	Prattville	11 a.m., Nov. 17	Grading and draining	W. S. Kellar, St. Hwy. Engr.
O.	Youngstown	1.30 p.m., Nov. 17	Glenwood Ave. extension	Comrs. Rd. Dist. No. 1.
Cal.	Sacramento	Nov. 17	State highway work	A. B. Fletcher, State Hy. Engr.
Kan.	Leavenworth	noon, Nov. 17	Improvement of portion of Elm Grove Road	J. A. Hall, Co. Clk.
Mo.	Kansas City	Nov. 18	Sheet asphalt, cement sidewalks	E. J. McDonnell, Sec.
Minn.	International Falls	Nov. 18	Rural highway, 98 miles	H. L. Slocum, Co. Aud.
Fla.	Plant City	2 p.m., Nov. 18	Street pavement	W. L. Lowry, City Clk.
Ind.	Indianapolis	Nov. 19	Road repairs	W. T. Patten, Co. Aud.
Ore.	Jacksonville	Nov. 19	Rock excavation, concrete, etc.	H. L. Bowlev, St. Hy. Engr.
O.	Cleveland	noon, Nov. 19	Furnishing material and labor for road improvement	H. H. Canfield, Clk., Cleveland Heights.
O.	Cincinnati	noon, Nov. 21	Repairs	F. E. Wesselman, Pres. B. C.
La.	New Orleans	Nov. 24	Sixteen miles of road	W. E. Atkinson, St. Bd. Engrs.
N. Y.	Tonawanda	Nov. 24	Concrete pavements	Ellsworth Bros., Engrs., Buffalo
O.	Jefferson	Nov. 28	Grading and paving	H. Johnson, Clk.
Ind.	Fort Wayne	10 a.m., Nov. 29	Improvement of highways	C. H. Brown, Co. Aud.
Ill.	Elgin	About Dec. 1	43,000 sq. yds. brick paving	A. Fehrman, Mayor.
<b>SEWERAGE</b>				
Wis.	Black River Falls	5 p.m., Nov. 8	Sewer	City Clk.
N. J.	Ancora	11 a.m., Nov. 10	Sewage disposal plant for Camden Co. Sanitorium	F. W. George Clk. Bd. Freeholders.
Ill.	Oak Forest	Nov. 10	Disposal plant for infirmary	R. E. Kenyon, Co. Supt.
Minn.	Duluth	10 a.m., Nov. 10	Sanitary sewer	C. S. Palmer, Clk.
Pa.	Altoona	Nov. 11	Sewage disposal works	H. E. Gamble, Pres. Bd.
Ill.	Chicago	Nov. 11	Sewer	Clk. Sanitary Dist.
N. Y.	Brooklyn	11 a.m., Nov. 12	Sewer construction	L. H. Pounds, Boro. Pres.
O.	Wapakonts	Nov. 12	Intercepting sewer and accessories	Hv. Moser, Dir. Pub. Serv.
D. C.	Washington	10.30 a.m., Nov. 13	Vitrified pipe sewer	Maj. F. C. Boggs, Gen. Pur. O.
O.	Cincinnati	noon, Nov. 14	Storm water sewers	F. E. Wesselman, Pr. Bd. Comrs.
Kan.	Council Grove	Nov. 14	Sewer system	A. Smith, City Engr.
O.	Cleveland	noon, Nov. 14	Relaying drain pipe, etc.	A. Reinhardt, Clk. B. Co. Com.
Neb.	Bancroft	Nov. 17	Sewer system	Towle Engr'g Co., Omaha
Ill.	Dixon	Nov. 17	Sewers, 14,800 ft. 6 to 30-inch	C. F. Nesbit, Engr.
N. J.	Elizabeth	8 p.m., Nov. 17	300 ft. 10-inch sewer pipe	W. P. Neafsey, St. Comr.
N. J.	Newark	2 p.m., Nov. 18	Section 1 of Passaic Valley sewer	J. S. Gibson, Clk. P. V. S. C.
Pa.	Butler	8 p.m., Nov. 18	Cleaning and repairing 4,000 lin. ft. terra cotta sewer	H. E. Coulter, Sec. Boro.
O.	Cleveland	noon, Nov. 18	Sewers	H. H. Canfield, Clk., Cleveland Heights.
N. J.	Newark	Nov. 18	Sewers	J. S. Gibson, Clk.
Minn.	Fairmont	Nov. 20	Sewers in 11 blocks	A. Marsden Engr., Ames
Kans.	Salina	Nov. 24	Sewer line	City Council
Ga.	Savannah	Nov. 25	Drainage system, 70 miles; pumping station	S. Cone, Ch. Board
Fla.	Tampa	Dec. 2	Sewerage system	Bd. Comrs. Pub. Wks.
N. J.	Newark	2 p.m., Dec. 9	Section 3 of outfall pressure tunnel	J. S. Gibson, Clk., Passaic Val. Sew. Comrs.
N. J.	Newark	Dec. 16	Section 3 of the Passaic Valley Trunk Sewer	J. S. Gibson, Clk., Passaic Val. Sew. Comrs.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>WATER SUPPLY</b>				
Colo., Denver	2 p.m., Nov.	10..	3,084 ft. 6-inch water main	E. Van Cise, Pres. P. U. Comn.
Wash., Oroville	Nov.	10..	Oil burning or distillate 50 H.P. engine	City Clerk.
O., East View	noon, Nov.	10..	Six-inch water mains	A. A. Smith, Vil. Clk.
Tenn., Nashville	10 a.m., Nov.	11..	Furnishing 75 fire hydrants	J. W. Dashiell, Sec. Bd. Comrs.
N. J., Wallington	8 p.m., Nov.	12..	Extension of pumping station	C. Dekeyser, Boro. Clk.
N. Y., Ossining	noon, Nov.	12..	Water supply	J. R. Riley, Supt. State Prisons
D. C., Washington	2 p.m., Nov.	12..	Vertical boring and turning mill for water dept.	Dist. Comrs.
D. C., Washington	Nov.	13..	28,400 ft. galvanized wrought iron or steel pipe, etc.	Isthmian Canal Comn.
N. J., Highland Park	Nov.	13..	Motor pumping engine	Council.
O., Frankfort	Nov.	14..	Water works	N. P. Weishart, Vil. Clk.
Man., Winnipeg	11 a.m., Nov.	15..	Installation of 5 complete pumping units	M. Peterson, Sec. Bd. Con.
T. H., Pearl City	Nov.	15..	Steel tank and tower at Naval Station	H. W. Stanford, Ch. Bur. Yds. & Docks, Wash, D. C.
Neb., Auburn	Nov.	17..	Reservoir, power house, pumps, electrical equipment	Churen Howe, Mayor.
Ont., Toronto	noon, Nov.	18..	Construction of 84-inch conduit	H. C. Hocken, Ch. Bd. Con.
O., Lima	noon, Nov.	18..	Water supply system	G. E. Whitney, Lima State Hosp. Com.
O., Cleveland	noon, Nov.	18..	Water main	H. H. Canfield, Clk., Cleveland Heights.
Cal., Riverside	Nov.	20..	Improvements to water works system	H. E. Cree, City Clk.
Neb., Silver Creek	Nov.	24..	Water works	D. F. Davis, City Clk.
Ont., Toronto	Nov.	25..	Installation of one or more pumping engines, etc.	H. C. Hocken, Mayor.
Mont., Great Falls	Dec.	18..	Concrete irrigation canal	U. S. Reclamation Service
Brazil, Therezopolis	Dec.	23..	Water works and sewage systems	Municip'l Cham., Therezopolis.
Kans., Lakin	Jan.	1..	Digging of artesian well	Kearney Co. Comrs.
<b>LIGHTING AND POWER</b>				
T. H., Pearl City	Nov.	8..	100 K.W. motor generator set & switchboard accessories	Bur. Yds. & Docks.
Ind., Richmond	11 a.m., Nov.	8..	Installation electric light system at county infirmary	L. S. Bowman, Co. Aud.
Pa., Harrisburg	noon, Nov.	8..	Furnishing underground cable	C. E. Diehl, Supt. Police Dept.
N. Y., Weedsport	Nov.	8..	Electric lighting plant, gas engine and producer	C. D. Van Alstine, Clk.
N. Y., New York	Nov.	10..	Electric lighting equipment for athletic field	C. B. J. Snyder, Supt.
Va., Lynchburg	noon, Nov.	10..	Ornamental Lighting system	H. L. Shaner, City Engr.
Pa., Allentown	10.30 a.m., Nov.	10..	Extensions to electric light system	H. C. Wernert, Clk. Bd. Comrs.
N. J., Linden	8 p.m., Nov.	13..	Street lighting	C. H. Smith, Boro. Clk.
Cal., Harmosa Beach	Nov.	21..	Furnishing and installing 8 ornamental lighting posts	City Clerk.
La., Baton Rouge	1 p.m., Nov.	22..	Lighting city with electricity	City Council.
Neb., Silver Creek	Nov.	24..	Electric light plant	D. F. Davis, City Clk.
Miss., Natchez	Dec.	3..	Public lighting contract	Lt. & Wtr. Com.
<b>FIRE EQUIPMENT</b>				
N. Y., New York	Nov.	10..	Fire alarm system in school	C. B. J. Snyder, Supt.
N. J., Highland Park	8 p.m., Nov.	13..	Fire engine	Jas. R. Earle, Boro. Clk.
Mass., Holyoke	4.30 p.m., Nov.	18..	Office apparatus for fire alarm system	P. M. Judd, Ch. B. Fire Com.
D. C., Washington	2 p.m., Nov.	18..	Installing 2 motor 2-wheel tractors and equipment	District Comrs.
<b>BRIDGES</b>				
Va., Monterey	noon, Nov.	8..	Two steel bridges	P. St. J. Wilson, St. H. Comrs.
Minn., Springfield	1 p.m., Nov.	8..	Three steel and concrete bridges	Bd. Brown Co. Comrs.
Kan., Neodesha	noon, Nov.	8..	Bridges	Township Clerk.
La., Vidalia	noon, Nov.	10..	Bridge repairs	J. P. Fagen, Sheriff.
Ill., Chicago	11 a.m., Nov.	10..	Bridge supplies	L. E. McGann, Comr. P. W.
Tex., Tilden	10 a.m., Nov.	10..	Bridge repairs	E. J. W. Booth, Clk. of Court
Kan., Turner	10 a.m., Nov.	10..	Reconstructing Turner bridge	F. M. Holcomb, Clk. C. Comrs.
Wyo., Newcastle	10 a.m., Nov.	10..	Wooden bridge	W. H. Dobson, Co. Clk.
Ill., Chicago	noon, Nov.	13..	Substructure for trunnion bascule bridge	John McGillen, Clk. Bd. Trus.
O., Cincinnati	noon, Nov.	14..	Concrete bridges	A. Reinhart, Clk. Co. Comrs.
Minn., Luverne	10 a.m., Nov.	14..	Concrete abutment and beam span bridge	O. I. Thompson, Ch. Twn. Bd.
O., Zanesville	11 a.m., Nov.	15..	Superstructure of bridge	F. C. Werner, Clk. Bd. Co. Comrs.
Cal., San Diego	1 a.m., Nov.	17..	12-span trestle bridge	J. T. Butler, Bd. Superv.
Minn., Internat'l Falls	10 a.m., Nov.	18..	Steel bridge	L. H. Slocum, City Aud.
N. Y., Glen Falls	2 p.m., Nov.	18..	Hudson bridge	L. F. Goodson, City Clk.
S. D., Armour	11 a.m., Nov.	18..	Bridges	C. F. Meyer, Co. Aud.
S. D., Castlewood	2 p.m., Nov.	18..	Steel, cement or pile bridges	Guy Osborne, Co. Aud.
N. Y., Albany	noon, Nov.	18..	Two bridges	D. W. Peck, Supt. Pub. Wks.
O., Zanesville	Nov.	18..	Superstructure of bridge	Bd. Commissioners.
Wis., Eau Claire	2 p.m., Nov.	19..	Reinforced concrete arch bridge	J. C. Fennessey, City Clk.
O., Cleveland	11 a.m., Nov.	19..	Bridge work	Jno. F. Goldenbogen, Clk. Comrs.
O., Cincinnati	noon, Nov.	24..	Hopple street viaduct	V. T. Price, Dir. Pub. Serv.
O., Toledo	10 a.m., Nov.	25..	Construction of bridges and culverts	Chas. J. Sanzenbacher, Co. Aud.
Can., Toronto	noon, Nov.	25..	Structural steel work for bridge	H. C. Hocken, Mayor.
Mass., Lawrence	Dec.	1..	Bridge, steel and cement	City Engr. Marble
S. D., Brookings	2 p.m., Dec.	2..	Steel, concrete or pile bridges	F. H. Ripley, Co. Aud.
S. D., Elk Point	noon, Dec.	23..	Steel, concrete and wood bridges	Ed. Holden, Co. Aud.
S. D., Clear Lake	2 p.m., Jan. 8, 1914	..	Steel and concrete bridges	A. L. Larsen, Co. Aud.
<b>MISCELLANEOUS</b>				
N. Y., New York	12.15 p.m., Nov.	10..	Construction of section of Subway	Pub. Ser. Commn.
O., Columbus	Nov.	11..	Reconstructing percolator	P. D. Kemper, Clk.
N. J., South Amboy	Nov.	11..	Construction fire house	City Clerk.
Mo., Kansas City	Nov.	11..	Collecting and disposing of garbage, 5 years	O. F. Jenkins, Sec.
Ga., Augusta	Nov.	12..	Retaining wall, 2,700 cu. yds.	N. Winfield, Chief Engr.
N. Y., New York	12.15 p.m., Nov.	12..	Construction of portion of subway	Ed. E. McCall, Ch. P. S. Com.
Mass., Holyoke	Nov.	18..	Underground fire alarm cable, also telegraph system	M. T. Ch.
Tex., Port Arthur	noon, Nov.	20..	Lock and dam canal	Jas. F. Wood, Engr.
N. Y., Buffalo	11 a.m., Nov.	25..	Reconstructing jail	A. C. Hinkle, Clk.
D. C., Washington	3 p.m., Nov.	28..	Construction U. S. Post Office at Cambridge, Ohio	O. Wendroth, Superv. Arch.
D. C., Washington	3 p.m., Dec.	19..	Construction of Post Office at Du Quoin, Ill.	O. Wenderoth, Superv. Arch.

## STREETS AND ROADS

**Birmingham, Ala.**—Ordinance has been adopted for various street improvements.

**Clanton, Ala.**—Construction of modern highway between Birmingham and Montgomery, involving expenditure of hundreds of thousands of dollars has been practically assured at meeting of Birmingham-Montgomery Highway Assn.

**Gadsden, Ala.**—Council will consider and probably pass ordinance providing

for paving Forest Ave. from Sixth St. to point near Seventh St. Attempt also will be made to pave Seventh St. from Forest to L. & N. tracks.

**Montgomery, Ala.**—DeKalb County will shortly begin construction of new sand clay road, to cost \$8,000.

**Montgomery, Ala.**—Plans are being made for construction of proposed boulevard between Birmingham and Montgomery.

**Phoenix, Ariz.**—Bonds in sum of \$25,000 for street improvements will be voted on November 26.

**Van Buren, Ark.**—Preliminary steps for paving entire city of Van Buren are being formulated by members of board of trade, city council and the county officers.

**Van Buren, Ark.**—One mile of macadam road will be constructed.

**Van Buren, Ark.**—Definite plans have been adopted for macadamizing of Log Town road.

**Alameda, Cal.**—It has been proposed that county issue bonds of \$300,000 or \$400,000 for purpose of paving the Alameda, of building a modern road to



Mount Hamilton, through the Pacheco pass, of connecting the western side of the valley with the state road leading from the summit of Saratoga mountain into the Big Basin, and other minor improvements.

**Pomona, Cal.**—Paving of Thomas St., from Third to Fifth Ave. is being considered.

**Richmond, Cal.**—Members of State Highway Commission, Board of Supervisors of Contra Costa county, the Richmond City Council and delegates of commercial organizations of this city and Martinez will meet in Martinez to discuss county's proposed purchase of \$257,000 worth of State highway bonds. It is generally believed that money will be voted out of county fund.

**Hartford, Conn.**—Widening of Allyn and Pratt sts. is under consideration.

**Stratford, Conn.**—Sum of \$5,000 has been voted for road work.

**Delaware City, Del.**—At special election held on question of making additional loan of \$5,000 for street improvement, loan project won by big majority.

**Wilmington, Del.**—Piece of road about 1/4 mile in length will be built.

**Jacksonville, Fla.**—Bids will be received by the board of bond trustees of city of Jacksonville, Florida, until Tuesday, November 11th, 1913, at 3 o'clock p. m., for the purchase of all or any part of the \$58,000,000 six per cent "City of Jacksonville St. Improvement Certificates." F. T. Richardson, chairman board of bond trustees.

**Sorrento, Fla.**—Bond issue of \$500,000 for roads will be voted on November 18.

**St. Augustine, Fla.**—Construction of brick road between Jacksonville & St. Augustine is being considered.

**Calhoun, Ga.**—Commissioners of Roads and Revenues of Gordon Co. have called special election for Nov. 15 for purpose of getting public to provide for issuing of \$100,000 worth of bonds for road building throughout county. This election, if successful, will give Gordon Co. part in Johnson-Sherman highway from Chattanooga to Atlanta, for it is specified that part of bond money will be applied in that direction. Each of 14 districts of county will share in benefit of bond in proportion to amount of taxes paid.

**Columbus, Ga.**—Building of new public road from Columbus to Warren Springs and Bullochville is being advocated. Road would be 12 miles in Muscogee County, 20 miles in Harris County and balance in Meriwether County.

**Alton, Ill.**—Alderman Frank Johnson is promoting scheme for paving roadway from C. P. and St. L. freight station to quarries along river front. It is planned to have road three-eighths of mile long and 22 ft. wide.

**Bloomington, Ill.**—Petition has been presented asking for pavement on Phoenix ave. between Park st. and Fell ave.

**Fort Wayne, Ind.**—Resolutions have been adopted for various street improvements. H. W. Becker is Clerk.

**Kendallville, Ind.**—City Council has instructed City Engr. F. L. Kuebler to prepare profile establishing grades in proposed Craeger addition, which will be opened by extension of Wayne St., from State St. to Railroad St.

**Laporte, Ind.**—Proposed macadamizing of New Buffalo and Three Oaks road is under consideration; cost, \$50,000.

**Portland, Ind.**—The Commissioners of Wayne county are planning to build two roads during coming summer out of concrete.

**Burlington, Ia.**—Bids have been received for paving of Bitter Sweet Pl. and Curran St. They were too high and Council decided to reject them.

**Ottawa, Kan.**—New sidewalks have been ordered.

**Salina, Kan.**—Ordinances have been adopted for construction of certain sidewalks.

**Lake Charles, La.**—It has been decided to advertise for bids for vertical fibre brick paving on Kirkman St., from Kirby to Lawrence, making start on an outlet to northern part of city from business section.

**Portland, Me.**—It has been decided that a water-bound macadam road with bituminous surface will be built between this city and Bath, to cost in neighborhood of \$200,000. Of this Government will contribute \$65,000, which is \$15,000 more than first allotment. New construction will be 26 miles in length and whole road 36 miles long.

**Baltimore, Md.**—Petitions urging paving with sheet asphalt of Eutaw st., from Baltimore to Madison st., signed by hundreds of professional men, bankers, wholesale and retail merchants have been laid before Mayor Preston.

**Rockville, Md.**—Chairman Weller of State Roads Commission has announced consummation of purchase by Commission of 16 miles of Union Turnpike, extending from District of Columbia line to Olney by way of Silver Spring, Norbeck and Oakdale, and from Olney to Ashton by way of Sandy Spring, the price being \$20,000. Chairman Weller has also announced that work of resurfacing pike will be started shortly and Commission hopes to finish about five miles before bad weather sets in. Cost of improving road will be about \$5,000 a mile. All toll gates will be abolished.

**Boston, Mass.**—Widening of Avery st. is being planned.

**Lawrence, Mass.**—Paving of Haverhill St. has been authorized.

**Lynn, Mass.**—Plans for widening and relocating Humphrey st. have been approved.

**Corunna, Mich.**—County Road Comrs. have asked for appropriation of \$31,000 for building of State trunk lines and other award roads in 1914, and \$5,000 to complete roads not finished in 1913.

**Grand Rapids, Mich.**—Kent Co. Good Roads Comrs. have requested additional appropriation of \$3,500.

**Port Huron, Mich.**—Electors will vote on question of bonding county for \$500,000 for good roads.

**Minneapolis, Minn.**—Plans for completion of improved highway from Minneapolis to Yellowstone national park, following old route of Yellowstone trail, are being discussed at interstate convention of good roads advocates and representatives of automobile clubs.

**Hannibal, Mo.**—Resolution has been adopted for grading of Leving Ave. John Deyer is Mayor.

**St. Joseph, Mo.**—Two bids have been received by Board of Public Works for paving of McDonald St., from St. Joseph Ave. to Seventh St., but both were rejected.

**St. Joseph, Mo.**—Work on highway across state from St. Joseph to Hannibal will be recommenced within few months.

**St. Joseph, Mo.**—Bids for grading of Renick St., from 33d to 35th, have been asked by Board of Public Works. Board will send to Council ordinance providing for cement sidewalks on Sixth St., Renick to Atchison. Board will also have sidewalk laid on north side of Charles, just east of Seventh St.

**St. Joseph, Mo.**—Ordinances have been adopted for improvement of various streets.

**Allenhurst, N. J.**—Cement culverts will be used at street intersections in Allenhurst instead of iron culverts recently proposed, according to motion passed by Borough Council.

**Trenton, N. J.**—City Engineer Swan and Street Commissioner McKeag are to make thorough inspection of all streets of city with view of determining just what repairs are necessary to place thoroughfares in condition for winter.

**Binghamton, N. Y.**—Plans to widen Court St. under the Dry Bridges are being prepared by City Engineer and will shortly be submitted to Common Council.

**Schenectady, N. Y.**—Ordinances have been adopted directing paving of Ontario st. from Broadway to Gunderland ave.; Edward st. from State to Albany st.; Cutler st. from Congress st. to Crane st.; Maplewood ave. from Chrysler ave. to Lakewood ave.; adoption of the report of board of assessors on paving of Cedar st.; Shannon st., the Plaza, and Bradt st., and grading of William st.

**Schenectady, N. Y.**—Widening of State st. is under consideration.

**Schenectady, N. Y.**—Ordinance has been adopted for opening and extension of Pitkin St. at cost of \$1,400.

**Watertown, N. Y.**—State will pave Dexter st. between two bridges with brick free of charge to towns or county.

**Asheville, N. C.**—Highway between Asheville and Charlotte is being planned.

**Enfield, N. C.**—Bond issue of \$60,000 has been voted for permanent improvement of public highways.

**Halifax, N. C.**—Bond issue of \$40,000 has been voted for permanent improvement of public highways.

**Sandusky, O.**—Construction of road between Cleveland and Sandusky along Lake Erie shore is proposed. Erie, Lorain and Cuyahoga counties are to pay the bill, under proposed plans.

**Bartlesville, Okla.**—Bartlesville citizens have raised fund of \$8,000 to build good roads and will increase amount \$2,000 before good roads work is started. When this sum is expended, it is planned to raise another \$10,000 to be expended on highways of this county.

**Harrisburg, Pa.**—Ordinance has been adopted for opening and grading of Whitehall St. C. A. Miller is Clerk of Common Council.

**Hazleton, Pa.**—It has been decided to make a new county bond issue for \$250,000 for new roads and bridges.

**Seranton, Pa.**—Provided that the Armstrong Cork Brick Co. will give a 5-year guarantee, Monroe and Quick Aves. in vicinity of Mulberry and Pine Sts. will be paved with a cork brick pavement, as result of action taken by Council Committee. Proposed pave material is 70 per cent cork and 30 per cent asphalt. Engr. Shunk has said that it would cost \$5.40 per sq. yd. for the cork brick laid on edge, while combination of brick and asphalt would cost \$3.50.

**Providence, R. I.**—Resolutions asking for extensive highway and sewer improvements in North Providence have been approved by unanimous vote of members of North Providence Impt. Assn. Resolutions will be presented to Providence City Council and to Metropolitan Park Comm. for consideration.

**Charleston, S. C.**—Various street improvements are being planned.

**Spartanburg, S. C.**—Improvement of Spartanburg-Tryon highway is being planned.

**Clarksville, Tenn.**—Another step has been taken in better roads movement in Montgomery county when county court elected a commission of seven suitable men to supervise expenditure of \$100,000 from sale of bonds, which are to be voted upon on November 8, if proposition carries.

**Corsicana, Tex.**—Resolutions have been adopted for construction of sidewalks on various streets.

**Corpus Christi, Tex.**—Widening of Furman ave. and paving of Water st. are being discussed.

**Temple, Tex.**—Bonds in sum of \$500,000 are being considered for road district embracing Temple and surrounding country.

**Terrell, Tex.**—Plans are on foot in this city to have several of prominent streets in residence district paved at cost of several thousand dollars.

**Waxahachie, Tex.**—Paving which is now in progress on W. Main St. is to be extended to Grand Ave., making total distance of exactly 1 mile from Public Square.

**Ogden, Utah.**—City Engineer H. J. Green has been instructed to advertise for bids for building of curb and gutter on Wall avenue between 27th and 28th Sts., and on Hudson Ave., between 23d and 34th St.

**Portsmouth, Va.**—Report has been adopted recommending that \$2,000 be voted to complete paving of High St. to Ninth Ave., Cottage Place.

**Richmond, Va.**—With approval of City Attorney and City Engineer, subcommittee of Council Committee on Streets, charged with solving bridge approach problem, tentatively indorsed plan calling for construction of wide thoroughfare from Main St. to northern end of bridge, along 15th, Dock and 14th Sts.

**Seattle, Wash.**—Resolutions have been adopted for various street improvements.

#### CONTRACTS AWARDED.

**Berkeley, Cal.**—Contract for paving of Shattuck Ave., from Ward St. to south city limits has been granted to Oakland Paving Co. by City Council. Work will be delayed until Southern Pacific and Key Route lines let contracts for their part of work. Shattuck Ave. is to become through this improvement one of best connecting links between Oakland and Berkeley.

**Hayward, Cal.**—For new road in San Lorenzo Dist. below Cherryland to Nissen Bros. of Hayward at \$1,368.30. Work includes putting in of curbing on road.

**Sacramento, Cal.**—State Highway Comm. has opened bids for building of strip of road 5 1/4 miles long in Humboldt Co. and 10 1/4 miles long in Riverside Co. In both cases lowest bids were less than estimated cost given by engineers of State Highway Comm. Fairbanks-Baechell Co. of Willits Mendocino Co. bid \$50,639 for Humboldt road, while Highway Comm. had estimated that road would cost \$56,034.67. The M. & R. Co. of Los Angeles had lowest bid for Riverside Co. strip. Bid was \$36,878.75, while Highway Comm. estimated 10 1/4 miles of road would cost \$45,227.49. Comm. will meet in a few days to make formal awards on bids. Other bidders for contract for building Riverside Co. road were: Highland Const. Co., Highland, \$53,789.25; M. A. Dantonville Co., Pasadena, \$46,438.25; P. O. & C. H. Howard Co., Los Angeles, \$39,963.80; Johnson-



Shea Co., Riverside, \$48,306.50; Jos. M. Montgomery Const. Co., Alhambra, \$38,723.60; Ben Pennybacker, Los Angeles, \$54,771.60; George S. Benson & Son, Los Angeles, \$43,434; John D. Marsh, Los Angeles, \$63,989.50; Rogers Bros., Los Angeles, \$44,436.25. Other bidders in the Humboldt Co. competition were: F. H. Green, Eureka, \$57,959; George H. Bradner, San Francisco, \$59,792.70. Advisory Bd. of State Highway Comm. will meet in a few days to award contracts.

**San Francisco, Cal.**—Contract has been awarded to Flinn & Treacy for paving and curbing Buena Vista Ave., from Buena Vista Terrace to Java St., \$9,079, and Ocean Ave. in front of Balboa Park, \$10,969.

**Hartford, Conn.**—To F. B. & W. H. O'Neil of Hartford, for paving work on Main and North Main Sts., at \$34,619. Work to be done by state and city calls for 4,940 sq. yds. of wood pavement on concrete base and 9,830 sq. yds. of recut granite blocks on a concrete foundation. Trolley company will put down 9,439 sq. yds. of wood pavement.

**Boise, Idaho.**—To Idaho Hardware & Plumbing Co., 720 Idaho St., contract by city, for construction of 7,925 lin. ft. of sidewalk, at 55 cts. and 7,853 lin. ft. of curb, at 29 cts., and 1,000 cu. yds. of embankment, at 40 cts.

**Kincaid, Ill.**—To John Brogan, Green Bay, Wis., for 200,000 sq. ft. of sidewalk at 11.99c per sq. ft., total cost, \$23,800.

**North Chicago, Ill.**—For paving Stile St., between 7th St. and Broadway, to Chas. Payne, of Waukegan, at \$12,341.60.

**Quincy, Ill.**—For paving Maine St., between 3d and 4th Sts., with brick, to Peter Simon, at \$4,055.

**Fort Wayne, Ind.**—The bid of C. E. Moeller Construction Co., \$2,666.52, for elevation of the sidewalks in Calhoun St. subway is low, and will be given the contract. The Gallagher & Ryan Co. bid \$2,875.62 for same work.

**Martinsville, Ind.**—To Otis Major & Co., contract by County Commissioners, for construction of Adams and Green townships gravel roads, at \$12,600.

**Lexington, Ky.**—To Carry-Reed Co., for improvement of Ransom Ave. with asphalt.

**New Orleans, La.**—Hampton Reynolds was lowest bidder at 29.4 cts. per cu. yd. for construction of Huguenot new levee, lower 5th Dist., right bank of Mississippi River. Bourg & Serpas were other bidders at 29.92 cts. per cu. yd. This is levee which caved in some weeks ago, just after the contract had been signed. There are approximately 35,000 cu. yds. of work to be done, involving total of \$10,000. Work has to be completed by Dec. 20 under penalty of \$50 a day. Bids were opened by President Leigh Carroll, of Leve Board; Engr. Lewis and Secy. Donner. The bids will be referred to Executive Committee.

**Rockville, Md.**—By County Commissioners to Warren F. Brenizer Co., of Washington, contract for construction of pike from Rockville to Potomac, distance of five and two-fifth miles, for \$42,387. One third of cost will be paid by good roads department of Department of Agriculture, out of Maryland's share of the appropriation for experimental road building, and remainder equally by state and county.

**St. Joseph, Mo.**—Board has awarded to Skilbred Construction Co. paving of Madison St., from St. Joseph Ave. to the west line of Walker's addition.

**St. Joseph, Mo.**—By Bd. of Pub. Works, contract for paving 16th St., between Lafayette and Penn Sts., with concrete to Land Const. Co. at \$1.19½ per sq. yd. Contract for paving Monterey St., between 6th and 8th Sts., has been awarded to Reinert Bros. Const. Co. at \$1.32 per sq. yd.

**Missoula, Mont.**—By County Commissioners, for grading a half-mile track at newly-purchased fair grounds to F. H. Bailey, of Hamilton, Mont., at \$0.34 a cu. yd. Work involves 20,600 cu. yds.

**Keyport, N. J.**—Bids for laying of sidewalks on property in Atlantic, Church, Elizabeth and Osborne Sts., where not already put down, have been received as follows: George Van Dorn, 14 cts. a sq. ft., concrete; C. D. Wolf, of Bradley Beach, 14½ cts. a sq. ft. concrete, 18 cts. a sq. ft. blueflag. Contract was awarded to George Van Dorn.

**Rahway, N. J.**—Street Committee has reported bids of Charles Lentz, Jr., and the Weldon Construction Co. for paving of Main St., from Elm Ave. to Irving St. Bid of the former was \$4,464.75, while Weldon's was \$4,468.50. Contract was awarded to Mr. Lentz.

**Amsterdam, N. Y.**—By State Highway Commissioners for paving West Main st., to Martin Murray, Troy, at \$105,751.

**Great Neck, L. I., N. Y.**—For repaving Station Road, to Gashman Bros., of Roslyn, at \$15,373.

**Monroe, N. Y.**—Contract has been entered into between Henry Rumsey of Harriman and the Town of Monroe for the construction of a new section of road near the property of John Cornelius on road passing Fountain Farm. New section is to be about 150 ft. long and is intended to do away with a hill of 22 per cent. grade.

**Syracuse, N. Y.**—By Board of Contract & Supply, for paving Milton ave. from Topkins st. to West Genesee st., with brick, to Guy B. Dickison, of that city, for \$33,140.

**Cincinnati, Ohio.**—By Board of Commissioners of Hamilton County, contract for repair work on West Miami River Road, to Toph & Holden, at \$29,482.

**Massillon, O.**—Philip Diefenbacher and Sons of Massillon have been awarded contract to build Absolem Miller culvert, Tuscarawas township for \$677.50 and the A. T. Grant culvert in Sugar Creek, for \$232.80 by county commissioners.

**Eugene, Ore.**—By council for paving of Alden st. from 11th ave. to Mill race to Clark and Henry Company at \$1,938.60.

**Harrisburg, Pa.**—Borough Council of Dorranceton, Luzerne county, has submitted lowest bid for construction of state aid highway in that town when bids were opened at state highway department, this being first instance known where municipal body has bid for a contract. Council bid \$15,552.65, there being four other bidders.

**Spokane, Wash.**—To C. M. Payne two contracts for street improvements by city council on recommendation of Commissioner of Public Works Z. E. Hayden. He was awarded grading, curbing and sidewalk of Euclid ave., Addison to Lidgerwood st. at his bid price of \$1300; also grading, curbing and sidewalk of Addison st., Liberty to Fairview, at his bid price of \$1700.

## SEWERAGE

**Chicago, Ill.**—Bids are shortly to be opened for construction of enormous sewer along North Shore from Wilmette to Glencoe. Bidders are asked to figure on work either for brick, concrete or segmental concrete construction. Job includes construction in Wilmette, Kenilworth, Winnetka and township of New Trier. Specifications prepared by Sanitary Dist. are for excavation, concrete, reinforced steel, brick work, iron castings, structural steel and connection to outfall. Various appurtenances are to be furnished, including sewer pipe for future connections, manholes, rungs and miscellaneous work.

**Peoria, Ill.**—Construction of South Side sewer system is being considered.

**Lexington, Ky.**—Bids for construction of northside main sewer have been opened. The five bids submitted were: Foy-Proctor Company, \$46,812.18; Carey-Reed Company, \$39,987.50; Edwin S. Larson, Louisville, \$37,771.00; Thomas O'Day, \$35,967.60; Central Construction Company, \$35,600.20.

**Louisville, Ky.**—At cost of about \$11,000 Board of Public Works will build lateral sewers in High st. from Thirty-fourth to Thirty-ninth; in Rudd ave. from Thirty-fifth to Thirty-seventh, and in the alleys from Woodland to Gibson between Twenty-eighth and Catalpa.

**New Bedford, Mass.**—At meeting of Committee on Roads, Bridges and Sewers, it was voted to recommend that sewer be laid in Brownell St. from Maple southerly; also trunk sewer in Taber St. to replace present 10-in. pipe sewer.

**St. Paul, Minn.**—Sewer bonds to amount of \$7,135.15 will be offered for sale by City Comptroller Handy, Oct. 29, under class "A" and \$3,683.05 worth of bonds will be offered for sale under class "B" at same time. Sewer improvements represented by this sale include following: Rose St., Cortland to Sylvan Sts., \$2,605.25; Vance St., James to Palace Sts., \$1,932; Reaney St., Atlantic to Clarence Sts., \$2,353.40; Astoria Ave., Milwaukee Ave. to a point 200 ft. north, \$234.50.

**St. Joseph, Mo.**—Ordinances have been adopted for construction of various sewers.

**Neligh, Neb.**—City of Neligh will receive bids on or before Nov. 1st, at six o'clock p. m., for purchase of District Sewer Bonds of said City, amount of bonds to be issued to be not less than

\$12,000 and not more than \$15,000. T. B. Sweitzer is Mayor and O. S. Causer is City Clerk.

**New Brunswick, N. J.**—Ordinance has been passed for construction of sewers in various streets. E. J. McMurtry is City Clk.

**Perth Amboy, N. J.**—Construction of 12-in. pipe sewer in Laurie St. has been authorized.

**South Amboy, N. J.**—City engineer has submitted report recommending construction of six-inch sanitary sewer on north side of Second st. between Stevens ave. and Potter st.

**Binghamton, N. Y.**—Proposition to construct sewer on upper portion of Mill st., which was introduced in the Common Council, is expected to solve problem of surface water disposal in that section.

**Schenectady, N. Y.**—Ordinance has been adopted for sewer in Blakeslee st. to cost \$3,600 and in Bricker st. to cost \$2,300.

**Schenectady, N. Y.**—On recommendation of Finance Committee comptroller has been authorized to reissue city notes for \$200,000 for sewage disposal purposes. Notes will become due November 12.

**High Point, N. C.**—Sewer lines are to be extended 1,800 ft. and Imhoff sewage disposal plant will be erected.

**Akron, O.**—Ordinances have been passed to issue bonds for construction of various sewers.

**Canton, O.**—Plans prepared by R. Winthrop Pratt, Engr., Hippodrome Bldg., Cleveland, for construction of sewage disposal plant have been approved by City Council.

**Chardon, O.**—R. Winthrop Pratt, Consulting Engr., Hippodrome Bldg., Cleveland, is preparing plans for construction of sewer system and sewage disposal plant here.

**Eugene, Ore.**—Council has rejected bids for building wooden outlet from trunk sewer into river, and sewer committee will be empowered to build same. Two contractors, James Kennedy Construction Co., and Applewhite & Stein, bid \$5,666 and \$5,300 respectively. City engineer's highest estimate, with maximum allowances, was scarcely over \$3,600 and sewer committee believe work can be done for \$3,000.

**Erie, Pa.**—Resolution has been adopted for construction of 24-in. storm sewer in Fourth St., from Ash St. to west branch of Garrison River.

**Harrisburg, Pa.**—Ordinance has been passed for construction of terra cotta pipe sewer in Forest st.

**Harrisburg, Pa.**—Plans for extension of sewer service have been drawn by City Engr.

**Johnstown, Pa.**—Ordinances have been adopted for construction of sewers in various streets. G. C. Deckman is Clerk.

**Columbia, S. C.**—Petition is being circulated for election on question of bond issue of \$500,000 for extension of sewage and water mains.

**Conway, S. C.**—Survey is being made of principal streets looking towards installation of sewerage and waterworks system.

**Denison, Tex.**—Work will shortly begin on construction of permanent storm sewer along south side of 200 block of Woodward St.

**Uvalde, Tex.**—Taxpayers will vote on \$35,000 bond issue November 15th, which, if carried, is to be used for sewerage purposes and also \$20,000 issue for street improvements. Indications are that both amounts will carry.

**Seattle, Wash.**—Resolutions have been adopted for various sewer improvements.

## CONTRACTS AWARDED.

**Richmond, Cal.**—By City Council, contract for construction of sewers in 17th st., to John Word, for \$7,173.

**San Francisco, Cal.**—By Bd. of Works, contracts as follows: Gorrill Bros., sewers in Visitation valley, \$104,301; Owen McHugh, sewer through Golden Gate Park from Lincoln Way and 30th Ave. to Fulton St. and 36th Ave., \$14,940.

**Statesboro, Ga.**—To Georgia Engineer & Contracting Co., of Clayton, contract by city for installation of sewerage system, at \$36,000.

**Genoa, Ill.**—For constructing sewers to E. M. Lanyon, of Waukegan at \$16,000.

**Orange, N. J.**—Better lighting of Park ave. is urged.

**Ithaca, N. Y.**—Proposition to install boulevard lights along business sections of College Ave. and Eddy St. is being discussed.

**Rochester, N. Y.**—Present type of arc lamps on Rugby Ave. will be replaced with Mazda lamps.

**Schenectady, N. Y.**—Public works committee has recommended mazda lights on concrete poles in various streets.

**Newbern, N. C.**—Bond issue of \$20,000 for installation of new electric lighting plant, waterworks and for other municipal purposes has been awarded to Newbern Banking & Trust Co.

**Youngstown, O.**—Installation of "white way" lighting system is being considered.

**Eugene, Ore.**—City Council has ordered installation of ornamental street-lighting system on Olive st. Bids will soon be asked.

**Port Arthur, Tex.**—Definite plans for the installation of ornamental street-lighting system on Proctor st. have been adopted.

**Parkersburg, W. Va.**—Plans are being prepared for installation of ornamental street-lighting system on Market st. Plans provide for about 90 lamps. System will be installed by Parkersburg, Marietta and Interurban Ry. Co.

**Madison, Wis.**—Plans are being prepared by City Council and Capitol Building Commission for ornamental lighting system for Capitol Park and surrounding streets. Plans call for 60 ornamental standards in park. Cost is estimated at about \$25,000, of which about \$10,000 will be paid by state.

#### CONTRACTS AWARDED.

**Dysart, Iowa.**—By City Council contract for construction of electric-light plant to Alamo Engine & Supply Co., Omaha, Neb., at \$12,809. This includes installation of power plant and the construction of overhead distributing system. Contract for transformers has been awarded to General Electric Co., Chicago, at \$481.

**Central Falls, R. I.**—Contract has been made by committee with Blackstone Valley Gas & Electric Co. to furnish light for the streets of city for 5 years. New Contract will call for 23 more incandescent lights and 15 additional 350 candle power lights, to take the place of arc lights now in use. In addition to all-night service, cost to city will be about \$90 less per year than it has been.

**Souris, Man. Can.**—By town contract to Accumulator Lighting Co., Ltd., of Winnipeg, Man., for installation of an electric light plant, at about \$4,000.

#### FIRE EQUIPMENT

**Dermott, Ark.**—Purchase of fire equipment has been authorized.

**Phoenix, Ariz.**—Bonds in sum of \$75,000 for fire department improvements will be voted on Nov. 26.

**Ansonia, Conn.**—Council has voted to appropriate \$5,500 for purchase of motor combination chemical and hose wagon for the Eagle Hose Company.

**Hartford, Conn.**—Purchase of two reels of hose is recommended.

**Suffield, Conn.**—Purchase of automobile chemical truck for fire purposes is under consideration.

**Bartow, Fla.**—Motor apparatus will probably be purchased.

**Cambridge, Mass.**—A new alarm system may be installed at cost of \$25,000. City Electrician O'Hearn.

**New Bedford, Mass.**—Erection of central engine house is advocated.

**Westboro, Mass.**—Installation of alarm system is under consideration.

**Biloxi, Miss.**—Purchase of new apparatus for the Back Bay Co. is under consideration. A combination auto hose and chemical engine is preferred.

**Linden, N. J.**—Report of Fire Chief Clarence E. Smith recommends that the Borough Council purchase 500 feet of hose, rubber boots, helmets and other equipment for the firemen; also that Council consider advisability of purchasing automobile for department.

**Long Branch, N. J.**—Installation of underground alarm system is planned.

**Ocean City, N. J.**—Bids will shortly be advertised for new station to cost about \$70,000.

**Rahway, N. J.**—Second lot of bids for triple combination fire engine has been received and opened by City Clerk Lambert, various bids and bidders being as follows: James Boyd & Brother, \$8,250 and \$8,750; Seagrave Co., \$9,000; American-La France Engine Co., \$8,000 and

\$9,000; New Jersey Fire Appliance Co., \$9,500 and \$10,000; Nott Fire Engine Co., \$7,250 and \$8,250; Robinson Fire Apparatus Manufacturing Co., \$8,000, \$8,500 and \$9,000; Knox Auto Co., \$8,000, \$8,500 and \$9,000; Dixon Cascade Pump Co., \$8,000 and \$8,500; Rhode Island Coupling Co., \$8,100 and \$8,400. Bids, specifications and communications have been referred to Fire and Water Committee.

**Poughkeepsie, N. Y.**—Purchase of tractor for Niagara Engine Company No. 2 is being considered.

**Raleigh, N. C.**—Request has been made of City Council by Chief Brockwell of fire department for what is known as pumping engine for service in that department. Pumping engine asked for is operated by gasoline and is somewhat larger than motor trucks now used by department here. Estimated cost, \$8,000.

**Wellsville, O.**—Bids will shortly be advertised for a motor combination chemical, hose and ladder truck. A. W. Phillips is chief.

**Albany, Ore.**—About 800 ft. of base will be purchased by fire and water committee.

**Bangor, Pa.**—Council will purchase up-to-date combination chemical engine.

**Wycombe, Pa.**—Local fire company will purchase chemical tanks, hose and other equipment.

**Sumter, S. C.**—Council has decided to purchase more hose at their next meeting. November 11th, 1,200 to 1,500 feet being needed.

**Austin, Tex.**—Bonds in sum of \$25,000 may be issued for installation of alarm system.

**Everett, Wash.**—Another piece of automobile apparatus will be added to fire department's equipment.

#### CONTRACTS AWARDED.

**Bloomington, Ill.**—Upon recommendation of finance and fire committees, council has voted to purchase automobile for Fire Chief Henry Mayer. Eight bids on cars were received by joint committee and bid of Ford Motor Company was lowest, this being \$550.

**St. Joseph, Mo.**—Under permit issued, city fire house at Ninth St. and Doniphan Ave. will be practically rebuilt. Contract has been awarded by Board of Public Works to the P. P. Buddy Construction Co., and cost will be \$2,175.

**Nyack, N. Y.**—To the Star Electric Co. of Binghamton, N. Y., for installation of an alarm system, at \$3,723.

**Lorain, O.**—To Nott Fire Engine Co. of Minneapolis, Minn., for two motor combination chemical and hose wagons and two tractors at \$17,000.

**Sandusky, O.**—To Ahrens-Fox Fire Engine Co. contract for furnishing this city with one motor triple combination wagon.

**Allentown, Pa.**—Fire committee has recommended that contract for motor driven combination hose and chemical apparatus for the Columbia Fire Company No. 4 be awarded to White Co., through their representative, the Baker Auto Co., of this city, for forty horsepower, four-cylinder, machine at \$5,000.

Several minor contracts were also awarded. One to Christ Peter & Co. for 18-inch hub brake for the Hibernia Hook and Ladder for \$362, and other to same firm for 22-inch hub brake for Liberty engine for \$150.

**Philadelphia, Pa.**—To Ahrens-Fox Fire Engine Co. for 4 steam fire engines.

**York, Pa.**—Fire committee of City Council has awarded contracts for new fire and chemical hose to Diamond Rubber Co. of New York City, and to Eureka Fire Hose Co. of New York City.

**Columbia, S. C.**—For furnishing 2,000 ft. of hose, contracts have been awarded as follows: Eureka Fire Hose Co. by P. O. Herbert, of Atlanta, Ga., Southern representative, 1,000 ft. at \$1.10; the Fabric Fire Hose Co. by J. J. Rafter, Southern manager, Atlanta, 1,000 ft. at \$1.10 (incorrectly given as 90 cents in our issue of Oct. 23.)

#### BRIDGES

**DeQueen, Ark.**—Quorum court has appropriated \$5,000 for steel bridge over Greenwood shoals on Little river. Little River county will furnish like sum to construct the bridge. Court has also appropriated \$1,200 for bridge over Saline river at Hoodenville and \$500 for bridge over Bear creek.

**Santa Cruz, Cal.**—Bond election will be held for voting on building of concrete bridge on Water st. across San Lorenzo river to cost \$17,000.

**Lake Charles, La.**—Two bids have been received for construction of proposed concrete bridge over Pithon Coulee on Ryan St., and have been referred to Commissioner Gorham to be figured. Rushmore & Gordy, Kansas City, offer to do the work for \$6,450, and Reinhardt & Donovan bid \$7,443.

**Lawrence, Mass.**—Bids will be advertised for construction of new Central bridge.

**Hinsdale, N. H.**—It has been voted to build new steel bridge over Ashuelot River on Depot st. and resolution has been adopted for town selectmen to contract for new steel structure estimated to cost about \$15,000.

**Jersey City, N. J.**—Construction of bridge from Bayonne to Elizabeth is being considered.

**Linden, N. J.**—Bids for erecting extensions on bridge over West Brook brook at Curtiss st., Linden, have been opened by committee of Board of Freeholders. Five proposals were received. Owing to figures of three of them being so close, award was held in abeyance for further consideration. Bids received were as follows: J. Foster Callahan, \$1,327.51; Zizzo Construction Company, \$1,448; Villa Brothers, \$974; Logan Construction Company, \$925, and John Bachman, \$975.

**Gloversville, N. Y.**—City Chamberlain O. L. Everest has sold last \$10,000 worth of \$20,000 bridge bond issue which were authorized at special tax election, May 10, 1910. They were purchased by Chas. Colwell, who represented Isaac W. Sherrill, of Poughkeepsie.

**Glens Falls, N. Y.**—Regardless of the fact that Saratoga Co. Bd. of Supervisors has not authorized \$80,000 bond issue voted by taxpayers of town of Moreau for its share of cost of proposed \$160,000 concrete viaduct to be built between this city and the village of South Glens Falls, Common Council of this city the Town Board of Moreau, have decided to advertise for bids from contractors for building of bridge, pending approval of the bond issue, on Nov. 10 by Supervisors.

**Charlotte, N. C.**—Board of Aldermen has ordered building of three new bridges.

**Cincinnati, O.**—Commissioners are planning reconstruction of damaged bridges.

**Eugene, Ore.**—County Court has taken action upon one of three bridges across sloughs near river road between Eugene and Junction, and granted bridge across Moffat slough.

**Hazleton, Pa.**—It has been decided to make new county bond issue for \$250,000 for new bridges and roads.

**Eau Claire, Wis.**—Bond issue for construction of bridge, amounting to \$10,000, has been passed.

#### CONTRACTS AWARDED.

**Claremont, Cal.**—The San Bernardino county supervisors have let contract for building bridges on Mesa ave. between Upland and Claremont. The Parlier Contracting Co. of Tulare has been awarded the contract. H. G. Klusman, of Cucamonga, has let contract for constructing bridge at Cucamonga.

**Washington, D. C.**—Bid of A. L. Guidone of New York for constructing \$275,000 concrete bridge to span Rock Creek, connecting Q St. in Georgetown with Q St. in Washington, was lowest of six proposals submitted for this work, according to announcement made. The amount called for in bid ranges from \$144,000 to \$153,400, according to quality of material to be used, plus cost of excavation, which is figured at \$28,715. This amount is within appropriation of approximately \$190,000 for construction of bridge proper, without the approaches. It is expected that arrangements for executing contract will be immediately entered into.

**Clearwater, Fla.**—By Pinellas Co. Comrs. contract to Edwards Const. Co. for construction of new bridge across Booker Creek on Ninth St. South, just outside city of St. Petersburg, at \$18,750.

**Eldora, Ia.**—By Board of County Commissioners, contract for construction of proposed bridge over Iowa River east of that city to Modern Structural Bridge Co., at \$38,000. Structure will be 920 ft. long and 18 ft. wide.

**Shreveport, La.**—By Caddo Parish Police Jury, to Austin Bros. of Dallas, Tex., for construction of bridge over Kelly Bayou, at their bid of \$31,000.

**Lincoln, Neb.**—Contract for completion of work on bridge across Platte river at North Bend has been relet to Standard Bridge Company of Omaha.



**Genoa, Ill.**—To E. M. Lanyon, of Waukegan, Ill., for installation of proposed sewerage system, at about \$16,000.

**Flint, Mich.**—Contract has been awarded to the U. S. Brass & Iron Fdy. Co. for manhole castings and catch basin casting at following prices: Standard manholes, weighing 350 lbs. at \$5.50 each; small catch basins, weighing 285 lbs., at \$4.99 each; large catch basins weighing 425 lbs. at \$7.25 each.

**St. Louis, Mo.**—To Thos. F. Hogan, of St. Louis, by Sewer Commissioners, for construction of 455 ft. of 4-ft. wide by 5-ft. high rock tunnel, and 4,350 ft. of 24-in. pipe sewer, at \$14,160.

**Newark, N. J.**—The Passaic Valley Sewerage Commission has awarded to O'Gara & McGuire, of this city, contract for construction of section No. 8 of big sewer at price of \$134,630. There were two bidders below that figure who were not considered responsible. Section extends from Third ave. through Passaic st., to point just south of the Mt. Pleasant Cemetery. Bids on section No. 19 were opened, but all were rejected because they were considered unsatisfactory.

**New York City, N. Y.**—To Peter B. Stanton, 2327 Walton ave., Bronx, by Borough of Bronx, for construction of sewers under six contracts, largest being Contract No. 5, at \$31,837.

**White Plains, N. Y.**—To Edward Jackman contract to build sewer in Battle Ave., from Waldo Ave. to Central Ave. His bid of \$977.25 was lowest of four submitted.

**Cincinnati, Ohio.**—By Dir. Pub. Ser., contract for construction of Clifton relief storm water sewer to E. W. Cannell & Ames Bros., Columbus, at \$50,724.

**Homestead, Pa.**—By Borough Clerk for construction of sewers in (a) 13th ave., and (b) 14th ave., to Frank Erbeck, (a) \$1.33 per lin. ft., and to Gibson Plumbing & Heating Co., (b) \$1.34 per lin. ft. Other bids as follows: Flaherty & Dimen, (a) \$1.25 per lin. ft.; (b) \$1.35 per lin. ft.; Masi Bros., (a) \$1.42 per lin. ft.; (b) \$1.42 per lin. ft.; Thomas A. Wilson, (a) \$1.95 per lin. ft.; (b) \$2.05 per lin. ft.; John P. Gibson, (a) \$1.35 per lin. ft.; (b) \$1.25 per lin. ft.

**Bay City, Tex.**—To H. W. Caldwell Construction Co., of Texarkana, for construction of sewer system at \$27,734.

**Thorpe, Wis.**—To F. E. Kaminski, of Watertown, Wis., contract by village, for installation of sewerage system, for \$11,807.

## WATER SUPPLY

**Montague, Cal.**—Municipal bond election held in Montague to determine whether town shall bond for \$25,000 for purpose of installing a water system has been carried.

**San Diego, Cal.**—A second bond election, as result of failure of people to cast necessary vote for one proposition in bond election held recently, may be held in San Diego soon. In last election people voted for improvements to water system which will be useless unless proposition in question, carrying \$645,000 bonds, is also voted.

**South Pasadena, Cal.**—City trustees in South Pasadena have passed on first reading ordinance calling for election on bond issue for purchasing water system, election to take place November 20.

**Carsen, Ia.**—Taxpayers will vote Nov. 10 on bond issue of \$15,000 for waterworks.

**New Albany, Ky.**—Bd. of Works has directed City Engr. Appleby to prepare plans and specifications for extension of city water mains in factory district in eastern part of city.

**Paris, Ky.**—Paris Water Co. will erect dam across Stover Creek.

**Boston, Mass.**—Comr. Rourke is urging City Council to appropriate \$100,000 for high pressure service.

**Ann Arbor, Mich.**—Bonds in sum of \$450,000 have been voted for purchase of waterworks plant.

**Mt. Pleasant, Mich.**—Filtration plant will be installed.

**Saginaw, Mich.**—Installation of filtration plant has been approved of. Estimated cost \$500,000.

**Jackson, Miss.**—Authorities of city of Jackson have rejected all bids on erection of proposed filtration plant and will readvertise.

**Hardin, Mont.**—B. C. Lillis of Billings has been awarded contract for construction of municipal waterworks system at Hardin. The waterworks plant will cost approximately \$30,000.

**Kalspell, Mont.**—Bond issue of \$175,000 has been voted for purchase of

water system and construction of \$2,000,000-gallon re-enforced concrete reservoir.

**Auburn, Neb.**—Plans have been perfected for waterworks system.

**Haledon, N. J.**—Bonds in sum of \$10,000 will be issued for water main extensions.

**Schenectady, N. Y.**—Ordinances have been adopted for laying of water mains in Davis terrace, Park st., Avenue B and Kenwood st.; authorization of the purchase of right of way for water mains over property near Brandywine ave., laying of water mains in Wright ave. and Hampton ave.

**Schenectady, N. Y.**—Only bid received for proposed water system construction at Glenridge Sanatorium was from Brown & Lowe for \$12,478. Estimated cost had been only \$5,400 and it was voted to reject this bid and advertise for new ones.

**High Point, N. C.**—High Point is to have constructed a 3,000,000-gallon pure water storage reservoir, also two 1,000-horsepower electrically driven directly connected centrifugal pumps with necessary connections, pumphouse, etc.

**Cresson, Pa.**—Movement has been launched by which one of two available streams in mountains south of this place is to be taken over by boroughs of Gallitzin, Sankertown and Cresson jointly, if possible. Proposition is that three boroughs elect to issue bonds for erection of water plant which would cost in neighborhood of \$150,000.

**Harrisburg, Pa.**—Ordinances have been passed for construction of water pipes in various streets.

**Pittsburgh, Pa.**—Bids have been opened by Department of Public Works of Pittsburgh for construction of water pipe line across Haight's Run bridge which was recently erected. Only two bids were received. M. O'Herron Co. bid for laying of 207 ft. of riveted steel 36-in. water pipe, \$13.25 per lin. ft., and for 215 ft. of 36-in. cast-iron water pipe, \$2.60 per lin. ft. Bid of Cummings Structural Concrete Co. was \$10.45 and \$5.85 per lin. ft., respectively.

**Anderson, S. C.**—Committee has been appointed by Council to draft franchise to be submitted to Southern Public Utilities Company to supply water and lights to city and people of Anderson.

**Columbia, S. C.**—Petition is being circulated for election on question of bond issue of \$500,000 for extension of water and sewerage mains.

**Georgetown, Tex.**—Bond issue of \$13,500 will be voted on Nov. 19 for sinking of artesian well.

**Lloydada, Tex.**—The recent \$20,000 water works bond election conducted in this city resulted in a victory, and as soon as the bonds are sold, work will begin on installing new system.

**Bedford City, Va.**—Advisability of establishing a liquid chlorine filtration plant is being considered.

**Centralia, Wash.**—Centralia City Commission has announced that it had closed deal with Weyerhaeuser Timber Co. for intake site and right of way for proposed gravity water system to be built by city from headwaters of Newaukum. It is expected that Commission will let the contract for building plant sometime in December. Pipe line will be 14 miles in length and the entire system will cost about \$134,000, the bonds for which were voted a year ago.

**Superior, Wis.**—City Comm. has passed resolution ordering Superior Water, Light & Power Co. to extend its water mains across Nemadji River to Allouez, with branch mains serving settled portions of that community, and such new mains and connections in First Ward as are needed to insure steady supply of water for Tenth Ward.

**Leaside Junction, Ont., Can.**—Plans are being prepared for construction of water and sewer system. Estimated cost is \$100,000.

**Montreal, Que.**—Bonds in sum of \$90,000 have been voted for extension of water system. L. N. Senecal is City Secy.

## CONTRACTS AWARDED.

**Cicero, Ill.**—For laying water pipe in 56th and 60th sts., and between 22d and 26th sts., by Board of Local Improvements to Charles M. Porter Co., at \$15,988.

**Fairfield, Ill.**—By Board of Local Improvement for construction of water works to Monie & Dunbar, of St. Louis, Mo., at \$27,462.

**Pontiac, Mich.**—By City Commission to Snow Steam Pump Works of Buffalo, N. Y., contract for 8,000,000-gal. pump at waterworks plant for \$25,750.

**Virginia, Minn.**—By Water & Light Commission to Risberg & Marwick contract for extension of water mains on Ash and Cherry sts. for \$3,632.

**St. Louis, Mo.**—By Board of Public Improvements contract for construction of superstructures of filters at Chain of Rocks, to McCormick-Coombs Construction Co., St. Louis, at \$89,730.

**Hardin, Mont.**—For constructing municipal water works to B. C. Lillis of Billings, at about \$30,000.

**Atlantic City, N. J.**—By Board of Commissioners contracts for (a) furnishing 48- and 30-in. c. i. pipe and special castings and (b) constructing the Meadow water main, as follows: (a) Florence Iron Works, 400 Chestnut st., Philadelphia, Penn., at \$138,166; (b) Atlantic Construction & Supply Co., Atlantic City, at \$119,266.

**North Tonawanda, N. Y.**—The Frontier Contracting Co., of Buffalo, has been awarded contract for laying of water mains in Clinton, Morgan, East Niagara and Hanover Sts. at its bid of \$2,638.50.

**Linnton, Ore.**—By City for reservoirs and pumping plant as follows: Willbridge District, to James Kennedy Construction Co., Portland, at \$18,473, and Willalatin Park District, to the Elliott Contracting Co., of Portland, at \$13,092.

## LIGHTING AND POWER

**Fort Smith, Ark.**—Movement has been started to change street lighting system on Garrison Ave. and to fill gaps in avenue "Great White Way." It is planned to replace present arc lights with white cluster lights located 50 feet apart on both sides of avenue from beginning of street at former Frisco station to 13th St.

**Phoenix, Ariz.**—Bonds in sum of \$25,000 for installing light standards for lighting streets will be voted on Nov. 26.

**Burlingame, Cal.**—Plans for new system of street lighting have been adopted by Trustees, which will make Burlingame one of best lighted cities of its size in the state. Beautiful electroliers will be placed in business district, and all supply wires will be placed underground.

**Denver, Colo.**—Park board has under consideration recommendation by Frederick Law Olmsted, civic beauty expert, that city erect ornamental shelter house on Bates triangle for convenience of passengers who use Colfax ave. and Broadway as transfer point on the tramway line.

**Brunswick, Ga.**—Installation of ornamental street-lighting system on New-castle st. is being discussed. The Board of Trade is interested.

**Fort Wayne, Ind.**—Resolution has been adopted for placing of lamp posts to be equipped with electric lamps for lighting purposes in and along the center line of Lawton Place, from Spy Run' Ave. to the St. Joseph River. H. W. Becker is Clerk.

**Union City, Ind.**—The Union City El. Co. will shortly purchase several thousand feet of steel-taped cable for connecting ornamental street lamp standards and from 50 to 75 ornamental boulevard lamp-posts for lighting main streets. D. O. Vaughn is manager.

**Salina, Kan.**—Extension of "white way" is being considered.

**Wilson, Kan.**—The Wilson El. Lt. Co. will be in the market shortly for ornamental street-lighting system, consisting of ornamental poles and series of street-lighting regulators.

**Everett, Mass.**—Estimates have been submitted to Board of Trade of cost of maintaining ornamental street-lighting system on Broadway from Boulevard to Glendale Square or from the Boulevard to Sumner st. Plans are for erection of 69 magnetite arc lamps, to cost \$8,743 per year if wires are underground, or \$6,849 annually if overhead.

**Kalamazoo, Mich.**—The Lighting Commission's recommendation that the Fostoria Light Co. be given contract for supplying of incandescent lights for city has been referred to purchasing committee of Council.

**Fergus Falls, Minn.**—City Council has ordered installation of ornamental street-lighting system, to cost about \$4,500.

**Booneville, Miss.**—The Booneville Water Works Co. will shortly erect series street-lighting system; will also chase a 50-kw or 60-kw. three-phase, 60-cycle generator, 200 meters and some transformers.